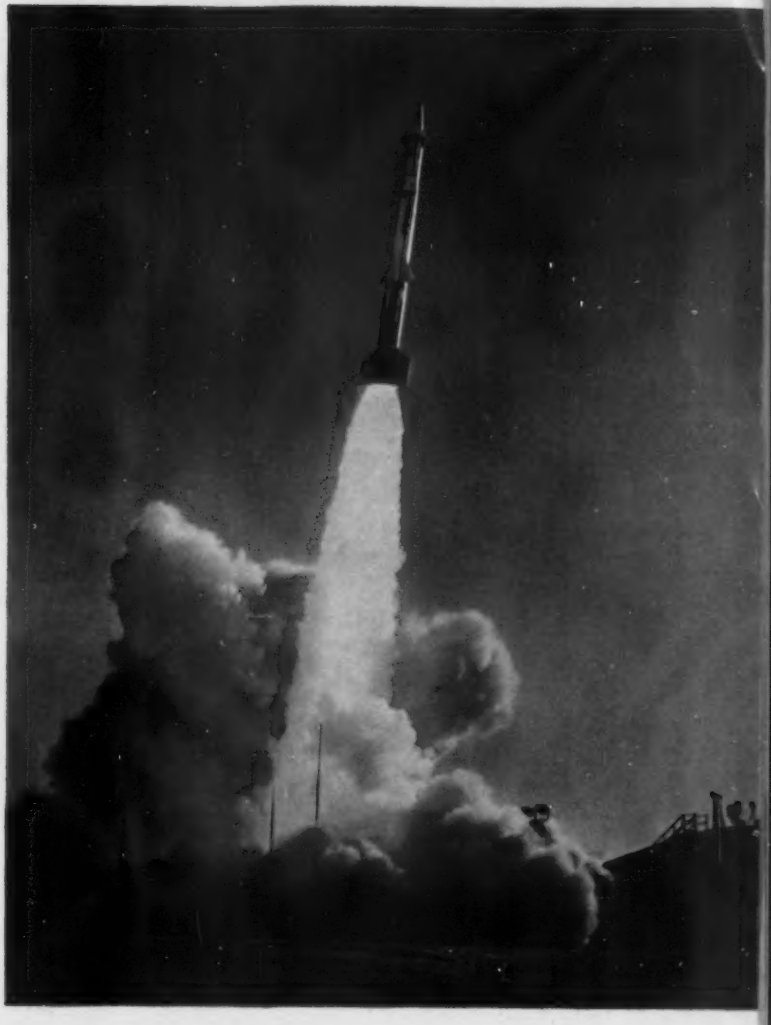
ARMY

FEBRUARY 1961 • 60¢

NIKE ZEUS



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ARMY

A PROFESSIONAL PUBLICATION DEVOTED TO THE ADVANCEMENT OF THE MILITARY ARTS AND SCIENCES AND REPRESENTING THE INTERESTS OF THE ENTIRE U. S. ARMY

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COVER

Nike Zeus test shot at White Sands Proving Ground

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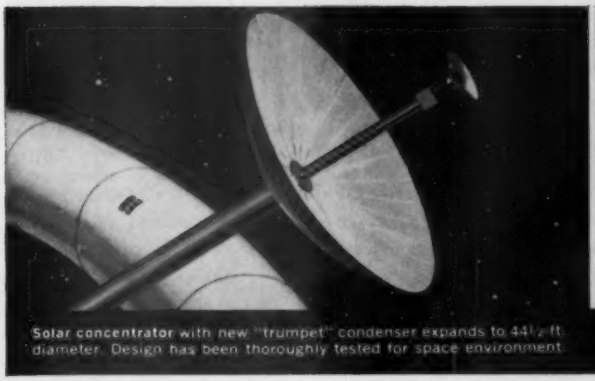

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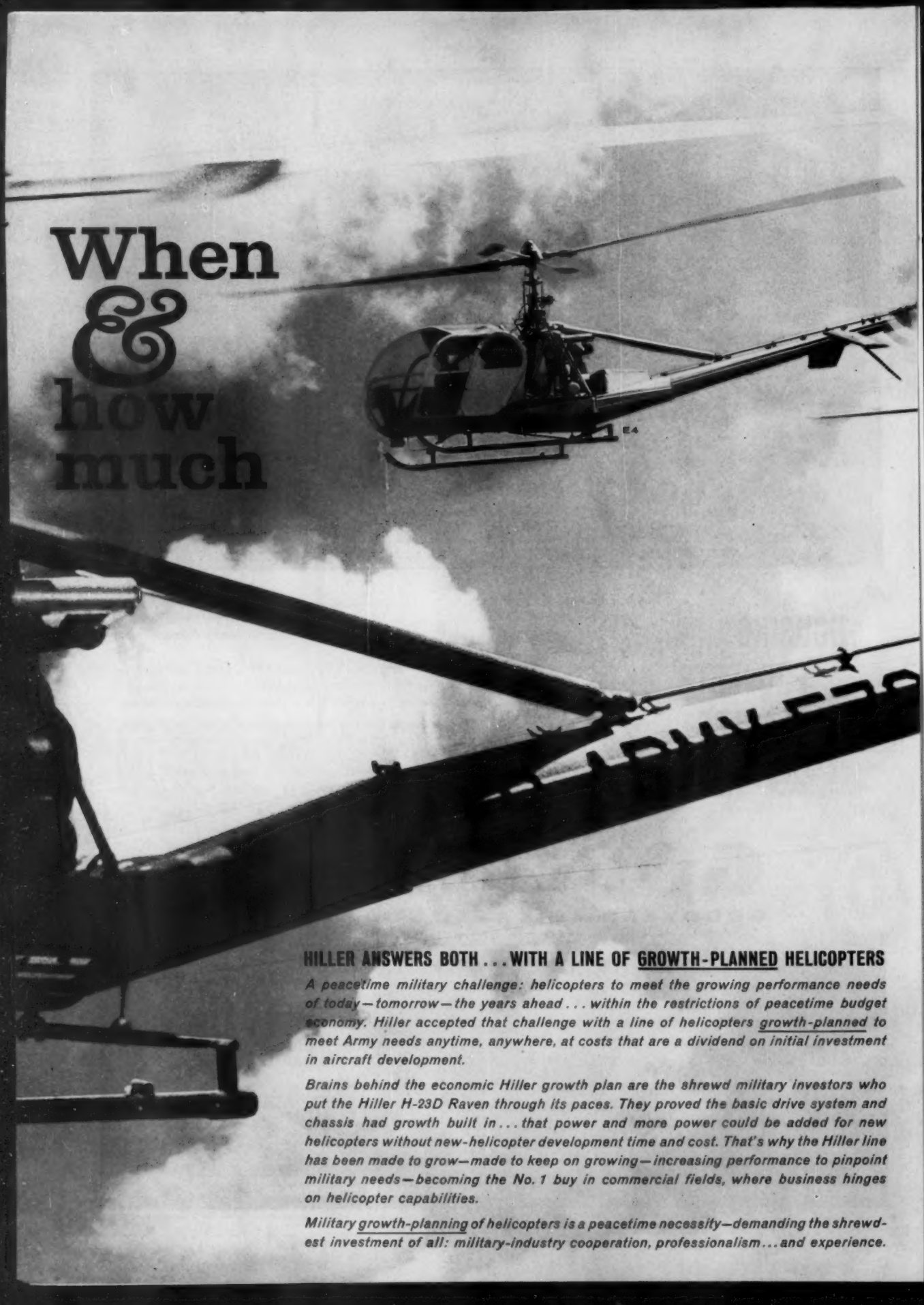

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ARMY letters

ANOTHER KEY WORD

● Hooray for Lt. Col. D. E. Pimpernel ["The Military Institution of the Ruritanians," December]! We need more like him.

Let's steal a lesson from the Ruritanians and strike a medal for those who can remember and recite all the slogans and key words of the past five years: ROCID, ROCAD, ROTAD, MOMAR, MAN, STRAC, MAXMAR, STRAF, CARS, and all the rest. This medal could be called the Grand Army Bagatelle (Exemplum). It would give us the opportunity to use another key word: GARBAGE.

MAJ. J. P. CANNON

San Antonio, Tex.

WE'RE BAD AND GOOD

● The Association of the U. S. Army is a worthy organization, and I am proud to be a member.

However, ARMY Magazine leaves a bit to be desired as a professional magazine for a young officer. Some of its articles are fantastic—such as the one in a recent issue which told how a small infantry copterborne force completely eliminated an entire enemy mechanized division which was apparently very backward and helpless before this so-called sky-infantry force. Others are just plain boring. On the other hand, a good number of articles are very well written and contain many good ideas. But there are too many articles that are written on a high-staff level, and not enough on a plane for the average reader—the young officer and noncommissioned officer.

NAME WITHHELD

HOLLOWAY PLAN VS. ROTC

● Shillelagh's letter in the December issue commenting on Mr. Lyons' article [October], indicated that the Navy obtains officers under the Holloway Plan, and states that it is not clear why the Army has no similar plan. Under the Holloway Plan, a future officer's tuition is paid through a civilian college. The product obtained is of a caliber somewhere between a graduate of Annapolis and one from the Navy ROTC, at a cost to the Government much lower than that of an Annapolis graduate and much higher than that for one from the ROTC.

I have never seen anything in print on this matter, but I have often heard that the great objection to the Holloway Plan was the low retention rate of such officers. That is, after being trained at a cost much higher than that for ROTC, the Holloway officers resigned at a rate that was about the same as that for ROTC graduates. If this is true, that is reason enough for not having a similar plan for the Army.

Does ARMY have any facts that confirm or deny the stories on high resignation rates among Holloway officers?

MAJ. DONALD N. GOWER

Atlanta, Ga.

● The Pentagon tells us that while under the Holloway Plan some officers accept career appointments, the Plan's basic aim is to build up a force of officers for the Naval Reserve. These officers are required to serve four years of active duty before being passed to USNR. While there has been no occasion to compare the resignation rate among Holloway Plan officers with that among graduates commissioned from the Army ROTC, the number does not exceed that foreseen in testimony given at hearings when the Plan was inaugurated in 1946.—ED.

ROTC AND PATRIOTISM

● There seems to be one important reason for much of the confusion and misunderstanding concerning compulsory versus elective ROTC. I understand that the various committees which have inquired into this matter have not conducted a fully nationwide inquiry. It appears that they have settled for a regional viewpoint of the New England and mid-Western states. If this is true, then all the dire predictions for the unhappy future of ROTC are based on the completely erroneous assumption that all colleges and universities feel the same as do the Ivy League and the Big Ten schools.

Why haven't representatives of schools in the South, Southwest and West been consulted? Don't their opinions count? I know one such representative who tries to be heard each time he learns of a hearing, but he has been turned down.

It looks like the Ivy League and the Big Ten tail is wagging the All-American dog. Surely we all remember that these are the same schools that raised such a ruckus over the loyalty oath required for federal loans to students. Has it suddenly become old-fashioned to be patriotic?

K. T. BORDERS

Texhoma, Okla.

WE'VE GOT IT MADE?

● The cover of ARMY for December looked inviting, so I turned it over. Here I saw ads which show real action. Why, the U. S. is really awake and going places: "a hit every time on supersonic bulls-eyes." These ads show more accomplishment, assurance and progress than indicated for many a moon by the dreary "low prestige," "second nation" news and commentators' columns.

So I kept on reading ads only, page after page. Boy, we've got it made! Cold war is just a dream, a mental toxicosis. Here is the real dope. We can knock 'em out of the skies and on land sweep the aggressors into the ocean. What's everybody worrying about? Here's one which says: "Name the weapon . . . the place . . . the time. Give us your training problems . . . let us provide practical solutions." What a relief! No need now to read the rest of the magazine. I'll sure sleep easy now.

Pass the gravy, please. Say, brother, we owe a big debt to these technical industries and research labs that almost guarantee to save us in spite of ourselves.

By the way, whatever became of "the military mind" over which there was so much fuss about a decade ago?

W. E. ROSEBUSH

Appleton, Wis.

SOLDIERS ARE AMBASSADORS TOO

● The very recruiting posters which, since time immemorial, have induced Army enlistments with their promise of "Travel, Adventure, Education," refute a State Department assertion as reported by the newspapers, that a soldier can assume he will live in the U. S. most of the time, short of war. The same spokesman went on to say that a man enters the diplomatic service on the assumption that he

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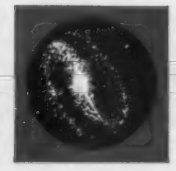

Aerolab Development Company, located at Pasadena, California, is a subsidiary of Ryan Aeronautical Company. Aerolab has developed more space probes and rocket-powered research models, including the Mercury Capsule model, which have been fired, than any other firm in the United States. Aerolab is a science team with quick reaction capabilities, and with special talents for solving advanced problems in Space.

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will live in the U. S. only occasionally and would not serve if he could not take his family with him.

The question arose when newspapermen asked the State Department "if balance-of-payments require that military men leave their families home when they go on overseas duty, why should the rule not be applied to the families of Foreign Service officers, too?"

I am forced to ask, where has this State Department spokesman been since 1945? I must assume that the person or persons who came up with this vapid argument must have spent the past 15 years behind the Iron Curtain, for that is, today, just about the only place where our "ambassadors in uniform" are not readily in evidence.

I'd be the last person to argue that Foreign Service personnel (in spite of their frequent, hurried and expensive evacuation from foreign countries) be required to leave wife and kiddies in the ZI.

But soldiers and their dependents, too, have been among the foremost exponents of the President's People-to-People program, and as such have made immeasurable contributions to better foreign relations. Our stack of Christmas cards bearing foreign postmarks should be proof enough.

SGT. HAHN FUGELMAN
Washington, D. C.

CURE FOR OJR BLUES

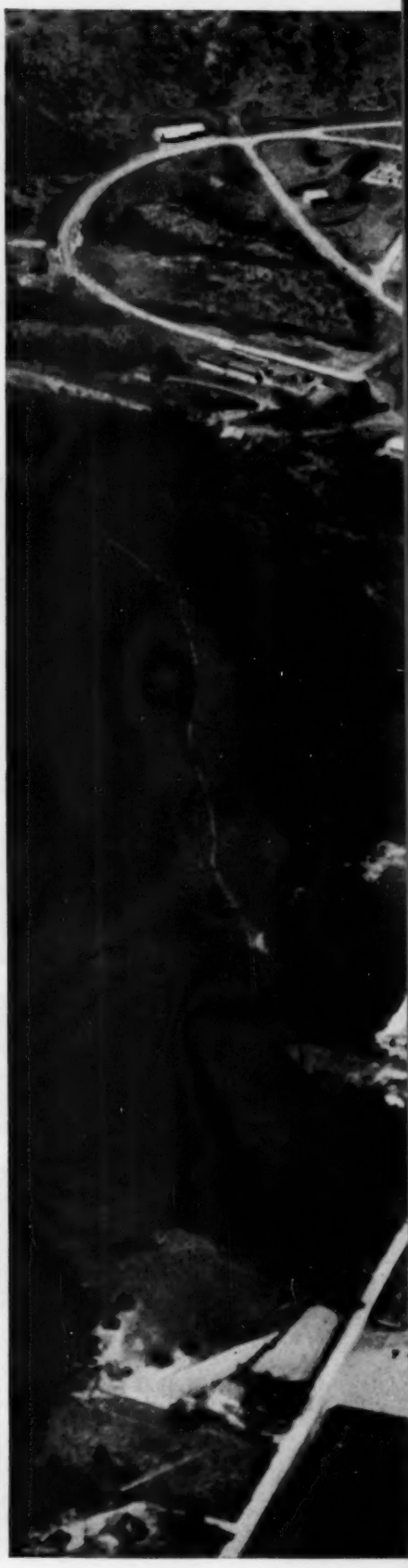
● "Those OJR Blues," in the July 1960 issue, is rather interesting, and concerns one phase of service life with which we all have long been familiar —the officer or enlisted man who has lost interest and whose thoughts are mainly on his future in civilian life. Other articles, published elsewhere, have reflected on the same problem. Through the years, all of us have seen it in various forms. It is common. There is the enlisted man who knows he has gone as far as he can; that no matter how skilled and enterprising he may be, he will get no reward during his remaining years of service beyond what will come if he merely keeps out of trouble. There is the Navy captain who knows three to five years ahead of his 30 that he has had it. The Army or Air Force colonel senses it as much as six or seven years ahead.

The effect of these service policies —announced and unannounced—that cause these results varies with the person affected. A few of these men put forth their best efforts right up to the last day. At the other extreme, some seem to make a studied effort to do the least they can get away with. The great majority serve their remaining time—neither deadbeating nor putting themselves to any unusual effort or taking any avoidable discomfort or risk. They lose a lot, but the services lose much more. The transition of otherwise good men with substantial potentialities into time-servers is almost wholly the result of service policies. Rationalize any way you will, these men have been told too far in advance that they are through so far as awards are concerned. All that remains ahead of them is a certain period of service, provided they do nothing that will cause earlier elimination.

The solution to this common problem lies in an attack on its causes, not in a treatment of its symptoms. First of all, if 20 or 30 years of service is the norm that is determined best, suppose we make this the average period rather than a fixed term. This can be done through legislation authorizing service secretaries to retire not to exceed five per cent annually of the low-efficiency end of each list as much as two years early, and to retain a corresponding number of the high-efficiency end of the same list for a corresponding period. By leaving the determination to the secretaries, the trimming of the list can be varied to meet conditions. The mere possibility of being included in that small discard to lower retired pay would be an effective control over the out-and-out deadbeats.

A second suggestion is that the current system of selection be modified to shorten the period between selection lists. In all three services, impose a system of semiannual selection boards and semiannual promotion lists for each grade. For each grade set a maximum time in grade, and for each service a total maximum time in service. Then, for each man, all selections by boards except for his last two in grade or service, would be on the basis of "best qualified"; that is, passovers do not count against him. His last two, for maximum time in grade or maximum time in service, would be on the basis of "fully qualified"; that is, passovers count, and failure to be selected would mean retirement six months after the second passover.

A final suggestion is that in each six-month promotion list for each grade, include the name of at least one person who otherwise would be in his last six months of service. This



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would result in a few men being promoted who had little time to serve. The cost would be trivial compared with the gain to the services from men who would feel there is still a chance of reward.

In brief, what I suggest is a thorough realization that most of us require both the urging of effective disciplinary measures and the hope of reward, if we are to do our best. Relatively minor changes in service policies and legislation can remedy most of the time-serving faults.

BRIG. GEN. H. T. MILLER
Miraleste, Calif.

IT WASN'T SITUATION NO. 2

● In the October issue Colonel Kintner examined an important phase of atomic policy in "Atomic Dilemma." We are not going to do better in the future unless we know what we did in the past.

Uninformed military discussions at the time of the Korean war attributed our failure to use atomic weapons to the lack of suitable targets. Colonel Kintner argues that there were many suitable military targets and two specific occasions when the use of atomic weapons might have been profitable.

Perhaps Colonel Kintner is applying our current atomic psychology to the conditions in Korea. I would agree, in any event, that even with the conditions of relative scarcity then obtaining, the use of atomic weapons at the time of the Chinese intervention was feasible and desirable to protect our committed troops.

Colonel Kintner notes objectively the effective Communist propaganda against any use of atomic weapons and its effect on the Free World. His appraisal, however, like our military appraisal during the Korean war, is deficient in its preoccupation with the physical aspects of the weapon. It was this physical appraisal which had channeled our thinking before Korea into preconceptions of large industrial complexes suitable for atomic targets. We had neglected the spectacular positive morale effects obtainable from the weapon. This kind of narrow preemptive thinking led to paralysis in time of crisis.

Actually, the ideal time to have used atomic bombs was in the first week of the invasion by the North Koreans. I knew at the time we had the bombs and the capacity to deliver them. I expected the Strategic Air Command to deliver a ground burst on the axis of advance of the North Korean army. This and the threat to use additional weapons would probably have stopped the war right there. The real issue was whether we would use the atomic weapon to preserve peace. Our answer was No!

We said No because the situation did not fit our preconceptions of nuclear weapons employment and because we feared international condemnation for using the weapon against a small Asiatic nation. So we fought the Korean war instead.

All the big decisions are simple, but not easy.

SHILLELAGH

ONE-ARMED-FORCE UNIFORM

● Recent rumors of a reorganization of the defense establishment into a single-uniform, one armed force lead me to wonder what the result will be. It may come out like Jan Zizka's streamlining of the Hussite forces in 1420 or thereabouts. It may be like the unprintable results of the man from Dundee, in that it would be quite a horrid mess with little resemblance to anything now known. Our doings of the last few years tend to the latter example.

Just picture the Army, Navy, Air Force, and Marines peaceably in one uniform. The Marines would secede first; the USAF couldn't see the point in abandoning their hard-won RAF blues; the Army and Navy have been ridiculing each other's haberdashery for more than 150 years. Clearly, the thing to do is draw on the best features of each.

For dress, let's try Army green coats, with USMC blue dress pants, Air Force garrison caps, and Navy anchor buttons. Then we could have a winter service dress consisting of Marine green coat, Army green trousers, Navy peacoat with AF silver buttons, and Marine cap in blue. The fatigue dress might be Navy white cap, Army or Marine jacket, AF trousers, and boots, with trousers bloused for Army and USMC, outside the boot for Navy and AF. Chevrons could be selected from all branches to suit the duty. For example, AF chevrons for flying and ground support enlisted men of aviation units, Navy chevrons for Transportation Corps type boat crews, and Marine stripes for amphibian ground combat units. On missions far inland, all people on foot or in trucks would wear Army chevrons. When they use inflated rubber rafts, they would at once sport Navy ratings. Should anyone fall off a cliff, he would be allowed AF stripes, though time would not allow flight pay.

Consider the effect on enemy intelligence. The Red G2 would face a motley mob that changed raiment as often as a chameleon on a Rob Roy plaid, and with stripes as varied as a racetrack tout's predictions. He would not only have to find order-of-battle dope, but determine what mode of transportation a unit moved by, in order to identify it as anything definite. This would lead to a large incidence of lunacy in Soviet espionage.

This could be carried even farther. Current color schemes for trucks call for AF blue, Army green, USMC green, Navy blue, and so on. Let's use fenders in one color, hoods in another, bodies yet another, and white sidewall tires common to all forces. We would really have sporty combat vehicles. Add to this color-changing paint for missiles. On the surface they would be OD. At 500 feet altitude they would change to AF blue, and on the way down change to USMC or Navy shades. Deception carried to the last degree.

If my scheme is adopted, think of its drastic effect on the Soviet forces. Those who aren't driven nuts will laugh themselves to death and we will have only the sober-sided Chinese Reds to deal with, plus Castro, on whom little seems to have an effect.

Out of all this would emerge the weirdest armed force ever seen, and our foes would be utterly confounded. If we don't know what we are doing, how in blazes could they possibly find out?

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ARMY authors

It is seldom that ARMY, which specializes in authoritative articles by professional military men, has as many authorities on one subject as we present this month in our coverage of the Nike Zeus anti-missile missile. Take a look at this line-up:

Lt. Gen. ROBERT J. WOOD (page 31), who as CG, Army Air Defense Command, will be using Zeus when it becomes operational, has also been Deputy Chief of Army Research and Development, and CG, Air Defense School.

Maj. Gen. AUGUST SCHOMBURG (page 36), CG, Army Ordnance Missile Command, is intimately involved in Nike Zeus development. General Schomburg has had varied assignments in the Ordnance Corps including Assistant Chief of Ordnance for Research and Development.

Dr. RICHARD S. MORSE (page 39), Director of Army Research and Development, and former member of the Defense Scientific Board of DoD, and former vice chairman of the Army Scientific Advisory Panel.

Brig. Gen. JOHN G. ZIERDT (page 40), was the project officer for Nike Zeus, before winning his star and becoming CG, Army Rocket and Guided Missile Agency, the organization most closely involved in Zeus development.

Brig. Gen. DAVID C. LEWIS (page 50), Director of Special Weapons, OCRD, came to this position by way of varied experience in field artillery.

Our remaining contributors are also authorities in their fields.

Lt. Col. WALTER A. GUNTHARP, Infantry (page 55), is Chief of the Foreign Developments Branch, International Division, OCRD.

Master Sgt. FORREST K. KLEINMAN (page 58), who recently retired, served with the 3d Infantry Division in Africa and Italy and as an officer with the 24th Infantry Division in Korea. Now retired, he has resumed a writing career which has included TV and motion picture scripts in the past.

Col. WALTER E. LORENCE (page 62), Corps of Engineers, retired, had extensive military and engineer civil works assignments during his long career.

Col. JOHN O. WEAVER, General Staff (page 64), has had many psychological warfare assignments. After a tour as Chief of the Troop Information Division of OCINFO, Colonel Weaver became a special assistant to the Chief of Information.

Our Cerebrationists this month include Lt. RICHARD N. GEREAU, Infantry (page 72), who is with the Combat Support Company, 1st Battle Group, 30th Infantry, in Germany. Maj. THOMAS W. BOWEN, Armor (page 72), who completed graduate work at Vanderbilt University before his present assignment at the U. S. Military Academy. Lt. Col. HARRY F. WALTERHOUSE (page 74), an MP officer, is on the staff of the Civil Affairs School at Fort Gordon, Ga. Capt. TREVOR W. SWETT, JR., Infantry (page 76), is on duty at the Combat Developments Experimentation Center at Ford Ord. Col. LEONARD H. FULLER, a former sergeant in the Kansas National Guard, wrote this article while commandant of the Noncommissioned Officers School at Fort Sill, Okla.

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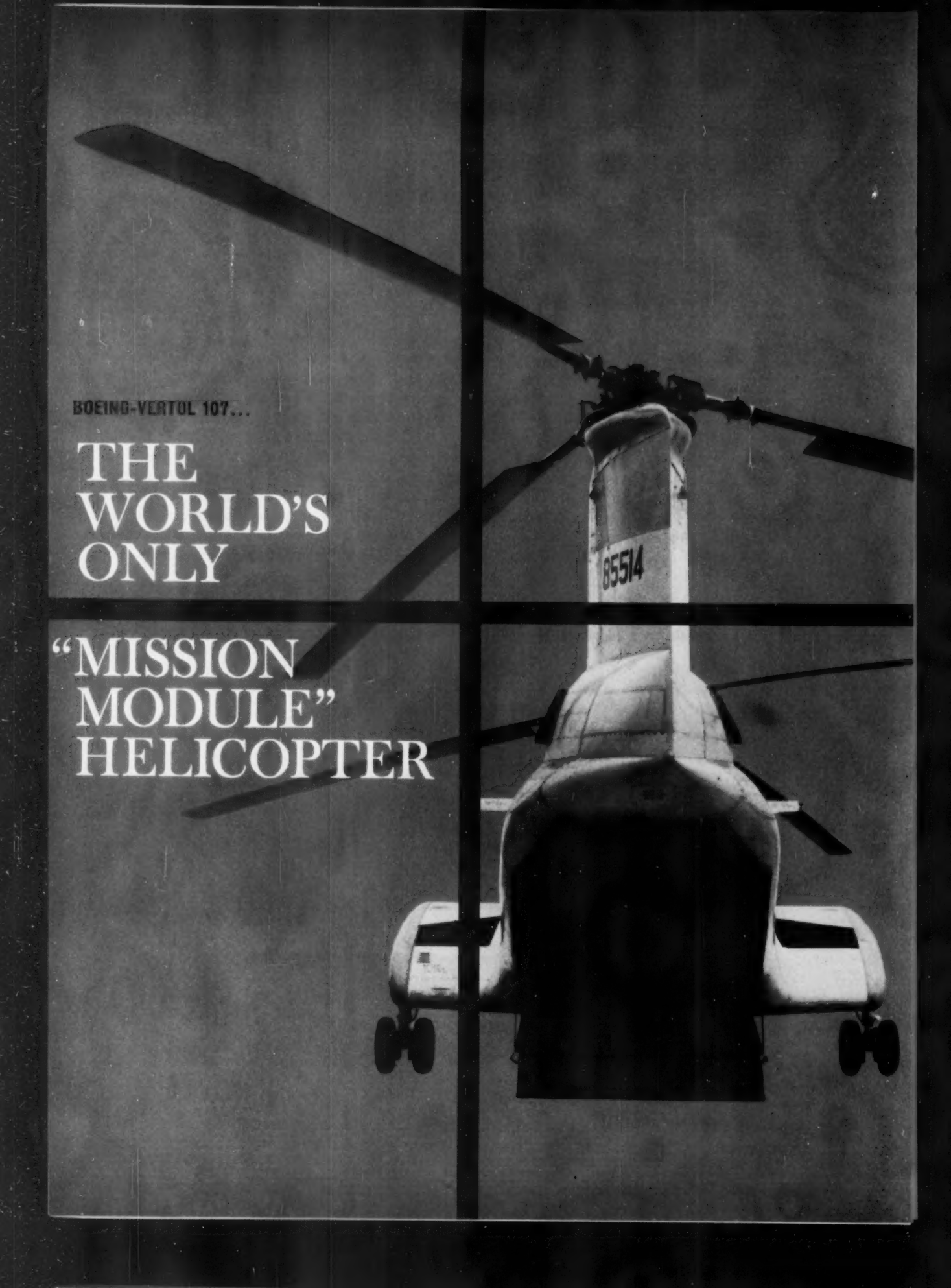
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The new twin turbine-powered Boeing-Vertol 107 is the only helicopter flying today that can perform so many military missions—without costly conversion of the basic aircraft. The rear loading ramp and unobstructed cargo area permit a variety of modules or equipment to be quickly and easily installed on the 107, thereby enabling it to perform specialized missions for any and all military services. The Navy, for example, can use the Boeing-Vertol 107 for minesweeping and fleet utility duties and then, less than sixty minutes after mission completion, convert to anti-submarine warfare—simply by installing Vertol's ASW module.

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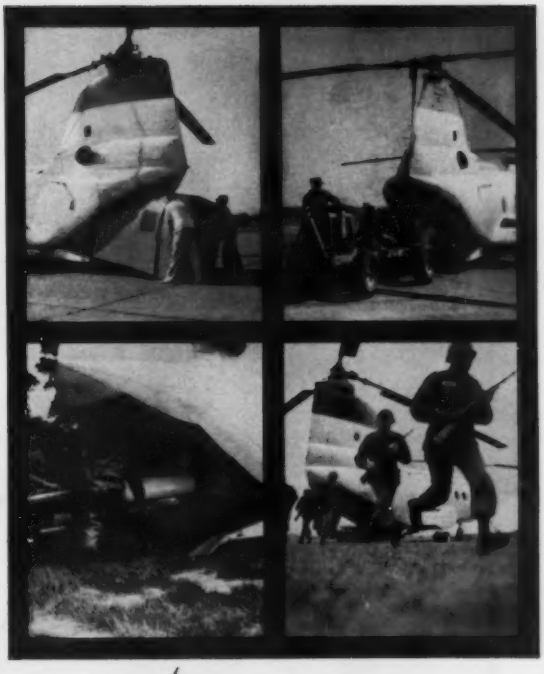
These are just a few of the capabilities that make the Boeing-Vertol 107 the *first* all-mission, all-service helicopter.



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Bolte Committee Recommendations

The mediocre officer can expect short shrift and the superior leader more rapid advancement if the recommendations of the Ad Hoc Committee to Study and Revise the Officer Personnel Act of 1947 are put into effect. The committee was headed by retired General Charles L. Bolte, USA.

The study, which required five months, contains 226 pages of recommendations to the Secretary of Defense for legislation designed to eliminate interservice disparities harmful to morale.

A period of five years would be allowed for phasing in the program following enactment of implementing legislation.

It was noted that some of the services, including top Army personnel authorities, had been generally satisfied with the workability of their present systems. Army sources made the point that uniformity for simple uniformity's sake is not necessarily a sound reason for abandoning systems already tested and found workable.

The study, however, was instigated at top executive levels as a means of arriving at a single policy for all services. "All have indicated that they can live with it," said General Bolte.

The Army questions the wisdom of reducing the number of its general officers, noting that this approach would cause a serious loss since it is even now short 61 spaces necessary to its requirements. Mere military population should not be a

ROBERT S. MCNAMARA
Secretary of Defense

ELVIS J. STAHR, JR.
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ROSWELL GILPATRIC
Deputy Secretary of Defense

Marshals of the New Frontier

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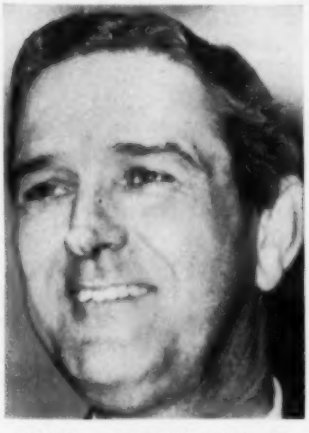
Secretary of the Air Force



JOHN B. CONNALLY, JR.
Secretary of the Navy

***TRIPHIBIOUS SUPPLY LINE*—sea, air and land. For the Army Transportation Corps, Sikorsky's S-60 *Skycrane* recently lifted a Conex container from the hold of a ship at sea; minutes later placed it in a truck ashore. The S-60 can carry five tons. The next *Skycrane*, the turbine-powered S-64, will lift up to ten tons. Future designs will carry up to 40 tons. Loads can be carried by cargo hook, or in pods for transporting complete units such as field hospitals, communications centers or personnel.**

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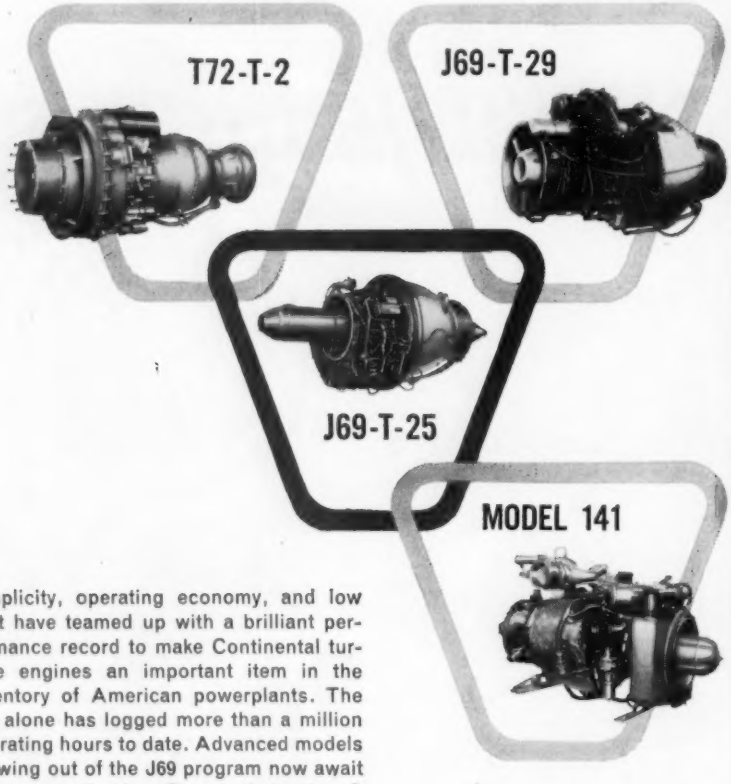

Simplicity, operating economy, and low cost have teamed up with a brilliant performance record to make Continental turbine engines an important item in the inventory of American powerplants. The J69 alone has logged more than a million operating hours to date. Advanced models growing out of the J69 program now await industry application. They include aircraft turbojets of 1,400 and 2,400 lbs. thrust, "aft-fan" turbofan engines of 2,600 and 4,000 lbs. thrust, a target-missile turbojet of 2,550 lbs. thrust, altitude thrust augmentation devices for existing turbojets, and the J69-T-35 air pump for boundary layer control. Rounding out Continental's capability in the field of aircraft propulsion is a completely new series of turboshaft and turboprop engines, including the 500-hp, 6,000-rpm 217-5A (U. S. Navy designation T72-T-2) turboshaft, which promises to find use in a wide variety of applications.

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FRONT AND CENTER

basis for apportionment of generals, the Army feels.

But in reducing the number of Army general officers by approximately 25, the committee noted that the Army's contribution to unified activities would be substantially reduced, thus making additional general officers available to meet Army needs. Queried about the effect on general officer MAAG assignments, General Bolte stated that this had not been considered by the committee. "We are not trying to keep up with the Joneses," he said.

The Army feels, too, that movement to a single lineal promotion list by date of rank, as recommended by the Committee, would not provide any more equity among the services than the present system. No "humps" needing legislative relief exist under the present Army system and the Army believes that no safeguards against such "humps" are contained in the committee proposals.

Upping the number of Air Force and Marine Corps lieutenant colonels and colonels while keeping the other services at approximately the same levels, was designed to bring the Air Force and Marine Corps up to par percentage-wise with the other services. In these services this action would also give the younger, competent officer a better picture of the future.

General Bolte said that the committee did not recommend mandatory ROTC training but had recommended provisions for all services to support full four-year scholarship ROTC programs similar to the Navy's Holloway program.

The study provided for a mandatory retirement age of 62 except for certain three- and four-star officers who may be retained to age 64. General Bolte expressed the belief that this would not substantially change the retired cost to the government. At the same time provisions were made for the service secretaries to order retired officers to active duty without their consent, and that such officers not be counted against service strengths.

Tracking Every "Bird" in a Flock

Keeping track of a sky full of "birds,"—whether friendly or enemy—poses one of the most complex problems in modern radar electronics.

Control centers must know where each aircraft is at all times, whatever the weather. This means its direction, its distance, and its altitude in relation to all other "birds" in the sky. And they must know instantly, for seconds are miles at modern speeds.

In cooperation with the Air Force, Westinghouse Electronics Division at Baltimore has developed a new 3-Dimension radar that can accomplish this difficult task—the versatile AN/FPS-27.

One radar supplies both search and height data simultaneously. In an automatic system, it can supply real time digital data on an unlimited number of targets.

The AN/FPS-27 and other 3-D radars such as AN/TPS-27 and AN/SPG-59, plus high-discrimination radar techniques such as Phalanx and Synthetic Spectrum, are examples of how the Baltimore divisions of Westinghouse are applying electronic science for Defense. *You can be sure . . . if it's*

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FABMDS

...One of many projects in Systems Engineering at General Electric's Special Programs Section

FIELD ARMY BALLISTIC MISSILE DEFENSE SYSTEM

Modern battle concepts of the United States Army require new tactical and support systems. Because of their increasingly complex nature, extensive capabilities in systems management and systems engineering have assumed greater importance.

It was for this reason that General Electric's Special Programs Section was established. Typical of its current projects is a study program for a Field Army Ballistic Missile Defense System. This system involves the integration of sensor components, communications links, data processing units, guidance, the vehicle aerodynamics, structures, stability and control, together with its launching and support equipment – all within a compatible systems structure.

To accomplish its objectives, SPS is staffed with a select group of senior engineers who act as a technical team to make systems recommendations... plan and create systems configurations and detailed specifications... establish implementation schedules... conduct continuing evaluation studies... direct and coordinate sub-contractor efforts – both within General Electric and outside the company.

Each engineer at SPS is highly competent within a broad field of technology, and has a working knowledge of several allied disciplines. He may concentrate on different aspects of a variety of problems, or follow a project, such as FABMDS, through to its completion.

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DEFENSE SYSTEMS DEPARTMENT of the Defense Electronics Division

FRONT AND CENTER

The committee further recommended retirement in the highest grade in which an officer has served on active duty satisfactorily for at least six months (except in cases of physical disability retirement).

General Bolte indicated that uniformity was partly the guiding criterion in the study and recommendations but emphasized that this was not to be construed as recommending the "One Service" concept.

The committee provided, to meet a special Army problem, for mandatory consideration for promotion of all Regular officers to the grades of captain, major, lieutenant colonel and colonel at 7, 14, 21 and 25 years of service, respectively, if not considered previously.

General Bolte saw no reason for Reserve officers to suffer under this concept of career management.

Commenting on the elimination of passovers and mediocrities, General Bolte said: "When I entered the Army, a man could be certain that if he simply kept his nose clean he would eventually serve the required length of time and be retired. Now there is no guarantee to

Nordic missilemen from NATO run a check on an acquisition radar at McGregor Range, N. M., while preparing for their annual Nike service practice. The Norwegians are from one of the six NATO nations armed with Nike Ajax and Hercules whose troops fired for record under USARADCOM supervision in the U. S. last year.

NIKE-ZEUS

Repeated successful R&D launchings of the U.S. Army anti-missile missile have demonstrated the reliability of its Thiokol booster. The Zeus' Thiokol motor boasts highest thrust of any single solid rocket in the free world...450,000 pounds. Thiokol means reliability!

Prime Contractor: Western Electric. Missile: Douglas.
Booster Motors Propulsion Contractor: Thiokol.

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Rocket Operations Center: Ogden, Utah

Nike-Zeus Motors produced at the Redstone Division

anybody—the less qualified officer goes out!"

In addition to General Bolte, the committee consisted of Lt. Gen. John F. Uncles, USA; Adm. E. Tyler Woolridge, USN; Vice Adm. Stuart H. Ingersoll, USN; Lt. Gen. Joseph Smith, USAF; Maj. Gen. Morris R. Nelson, USAF; Lt. Gen. Robert H. Pepper, USMC; and Brig. Gen. Forest C. Thompson, USMC. The committee was assisted by a staff of four active-duty officers: Maj. Gen. Ned D. Moore, USA, Staff Director; Capt. John R. Macroth, USN, Deputy Staff Director; Capt. Glendon D. Williams, USN, Deputy Staff Director; and Lt. Col. Lawrence H. Williams, USA, Staff Legal Adviser; and by two officers from the headquarters of each service.

Two More Little John Battalions

Two Little John missile battalions, to be activated early this year, are the 1st Missile Battalion, 18th Artillery, and the 1st Missile Battalion, 57th Artillery. They will be activated at Fort Sill, Okla.

Each battalion will have four launchers for the solid-propellant, nuclear-capable ground support weapon.

The Little John, produced by Consolidated Western Steel, Emerson-Electric, Hercules Powder Company, and Army Ordnance, weighs approximately 800 pounds and uses lightweight ground equipment for greater mobility and easy airlift.

King of a new frontier—the Army's Davy Crockett nuclear-capable ground support weapon is shown jeep-mounted and with warhead in place. The weapon, developed by the Ordnance Corps, gives small units a volume of firepower formerly possible only from massed heavy artillery. It can also fire conventional warheads. The nuclear shell was designed and developed by the Atomic Energy Commission.

Marksmanship Encouraged

The Army will be responsible for international-type matches under the all-service marksmanship competitions scheduled this year. The service chiefs have agreed that "small arms are the basic, personal weapons of every military man and skill in their use increases his confidence, professional capability and versatility."

They further agreed that a "growing awareness of these facts has resulted in several interservice small-arms competitions which have aroused enthusiasm and a healthy interservice rivalry."

The competitions this year will pit all U. S. services, including the Coast Guard, the National Guard and ROTC units, against each other.

The agreement calls for the Air Force to conduct the interservice pistol match; the Navy and Marine Corps to sponsor rifle competition; and the Army the international-type shoots.

NATO Nations Get Missiles

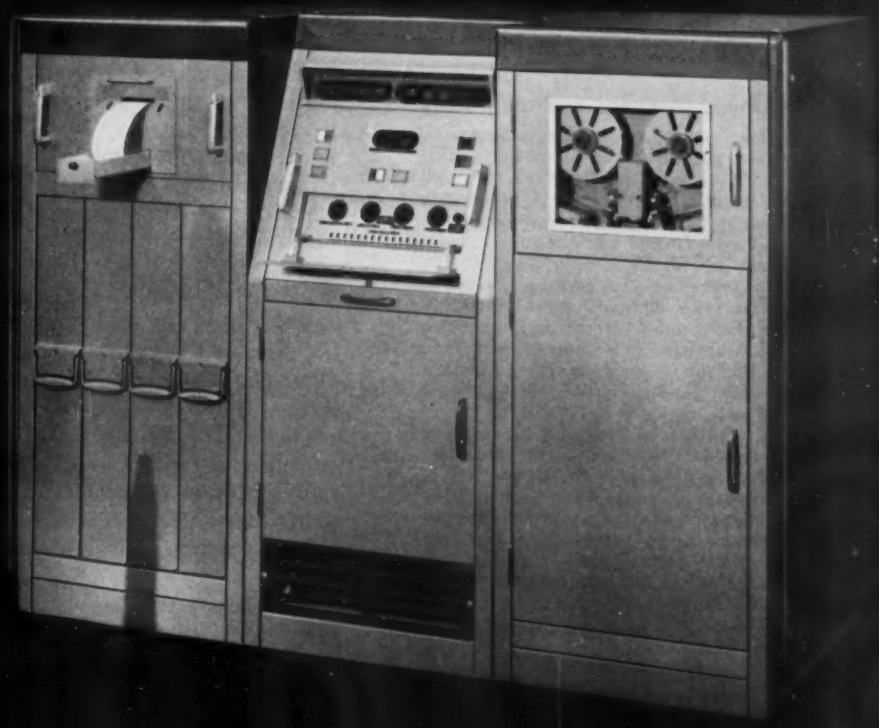
The U. S. and NATO are establishing large-scale facilities for production of advanced type missiles in Western Europe, reports Maj. Gen. August Schomburg, Army missile chief.

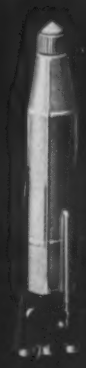
Belgium, France, West Germany, The Netherlands and Italy are to produce the Hawk air defense missile jointly.

General Schomburg said that 12 NATO countries now have the Nike Ajax and Nike Hercules missiles.

Also overseas are the Redstone, Honest John and the Jupiter with the Lacrosse ground support missile soon to be added to the list. Future weapons such as the new Sergeant, Pershing and Little John are also to be used for Allied defense.

A Step Ahead of the State of the Art in Ground Support Equipment





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In short, SCATE delivers 1) flexibility, 2) complete solid-state modularization, 3) fault isolation, 4) self-testing. Literature on request.

Engineers and scientists interested in challenging opportunities are invited to send résumés to Director, Technical Employment.

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Atomic weapons and small wars

Small nuclear weapons undoubtedly have an important place in tactical wars, so long as they can be used without laying waste to the civilian sector. The technological clock can no more be turned back in this respect than it can in strategic operations. But there are some parts of the world where the highly vulnerable nature of the social and economic structure rules out the indiscriminate exchange of nuclear weapons. Much of Western Europe (and the more crowded parts of Asia and Africa) would seem to fall in this category. A strategy is required for tactical wars, therefore, which will not face the United States with the alternatives of either destroying the existing civilization or abandoning it to an aggressor. An integral portion of this strategy would be the use of a deterrent capable of destroying, by means of nuclear weapons and long-range delivery systems, military targets primarily and selected political and even economic ones, in some cases—in the country committing the aggression. This strategy might well be coupled with ultimatums and prior warnings, in some instances.

That aspect of current American strategy which proposed to speed conventional forces to Asian and African "brushfire" wars is also subject to technological (and political) limitations. The entire nature of such wars has changed in the last two decades, yet the change has been largely ignored. Mao Tse-tung and other revolutionary leaders know much more about the new tactics than the professors at West Point, Sandhurst, and Saint Cyr. What is more, these revolutionaries have been winning their wars. They do not fight battles until they are ready. They may not even fight at all. They can afford to wait, for years, if necessary, with only an occasional hacked-up sentry, bombed café, blown bridge, or ambushed convoy to help them keep their hands in. Tanks, airplanes, and artillery are of only limited effectiveness in such wars, so long as the revolutionaries have broad popular support. And they will have popular support until the social, economic, and political inequities in their countries are corrected.

(Continued on page 26)

The Changing of the Guard

The changing of the civilian secretariat at the Pentagon inevitably suggests observations and comparisons that cannot be profound but may have some interest and perhaps help us understand the nature of these high offices. For understandable reasons we confine our remarks almost exclusively to the office of the Secretary of the Army, although knowing that much of the real power these days resides elsewhere.

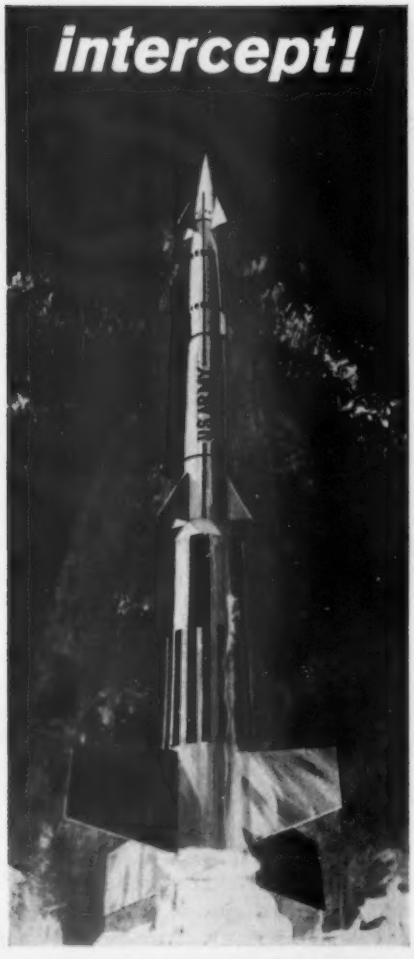
● A quick way to emphasize the difference between Mr. Brucker and his successor as Secretary of the Army is to note that in the year Mr. Stahr was born Mr. Brucker marched off to the Mexican border in the uniform of the United States Army. If by age, experience and outlook Mr. Brucker was representative of the Eisenhower "team." Mr. Stahr by age, educational background and intellectual achievements seems representative of the Kennedy "faculty." True, Mr. Stahr didn't attend Harvard, but he was a Rhodes scholar at Oxford, and that must be close to the next best.

● The fiction that service secretaries can come and go without having any discernible effect on the military establishment had just enough truth in it in the good old days to make it plausible. But it certainly is fiction today if for no other reason than the fact that Pentagon organization has become so weighted in direction of the civilian secretariat.

● Where Mr. Brucker was overwhelmingly successful in capturing the Army's admiration and loyalty, it is not disparaging to say that the record suggests that he was less effective in persuading Mr. Wilson, Mr. Quarles, Mr. McElroy, Mr. Gates and Mr. Douglas to the Army's point of view. It was not from lack of trying and the failures were, on hindsight, inevitable when the outlook, methods and values of the gentlemen are compared with Mr. Brucker's own considerable assets. These gentlemen and Mr. Brucker had the same ultimate objective, but their approach to the objective was along such different routes that it seems possible that they rarely quite understood each other.

● Mr. Stahr's visible attributes, as recorded by the press, suggest that he has the necessary equipment to be effective within the councils of the Pentagon secretariat. If this proves true and if he has in addition even a small portion of Mr. Brucker's passionate belief in old forms and traditional values, we can be hopeful that Mr. Stahr's stewardship will be most rewarding.

● If evidence is needed to sustain the assertion that there



The U. S. Army's NIKE-ZEUS is the only anti-missile missile system under advanced development. It is designed to meet the threat of enemy Inter Continental Ballistic Missiles. Developing a gigantic 450,000 lbs. of thrust at launch, the NIKE-ZEUS missile rises almost instantly to intercept enemy ICBMs traveling faster than 20 times the speed of sound.

HEART AND BRAINS OF THE NIKE-ZEUS DEFENSE SYSTEM CONCEPT

Extremely powerful long-range acquisition radar is designed to pick up the enemy ICBMs far from the defended area. Target track radars use the information provided by the long-range acquisition radar to "lock-on" to an incoming missile, relaying precise target information to electronic computers. These computers determine the most favorable point of intercept, automatically firing a NIKE-ZEUS missile at the correct time, guiding it to the intercept point.

CONTINENTAL ELECTRONICS TRANSMITTERS

Working under sub-contract to Bell Telephone Laboratories and Western Electric Company, Continental Electronics is designing, manufacturing and installing the powerful acquisition radar transmitters used in the Research and Development model of the NIKE-ZEUS Defense Complex scheduled for full scale testing on Kwajalein Atoll in the Pacific.

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ENGINEERS . . . FOR STIMULATING WORK ON THE ELECTRONIC FRONTIERS OF TOMORROW WITH A DYNAMIC, CREATIVE ORGANIZATION, ADDRESS RESUME TO CHIEF ENGINEER.

America cannot afford to invalidate its vast international aid programs by too rashly participating in local civil wars and thereby incurring the animosity of impoverished peoples.

These "brushfire" wars require a strategy which does not place the United States in the position either of doing nothing or of bogging down a ground army for years in combat with an opponent who will not fight battles and yet will not make peace. Conventional military forces and additional airlift will certainly be needed for some of these emergencies, but an unselfish and forward-looking foreign policy will be much more important.

The fact must be faced that no area can be held for the West if it does not want to be held. The only way to insure that the greater portion of a nation as opposed to an oligarchic governing group, wishes to align itself with the West is to demonstrate that the Western powers have the genuine welfare of the nation at heart. America's primary emphasis, then, should be on economic and technical assistance in alleviating the conditions which might lead to internal conflict. Military assistance in the form of equipment and other indirect aid will often be required, of course, to insure that well-organized armed groups do not take over the nation by force. A corollary of this point would be a refusal by the United States to grant military assistance to governments whose internal policies are repressive and provocative of armed rebellion. Where a nation friendly to the West is overtly attacked by a neighboring country, as happened in Korea, then the situation should be treated as any other tactical war. The primary emphasis should be on carrier-based air-power or any other available method of applying pin-point pressure on selected military and economic targets with minimal impact on the civilian population. Where the United States does not have adequate carrier or land-based air and missile power available, then the situation must be forthrightly faced that there are some portions of the earth's surface beyond the effective reach of American military force.

JOHN K. MORIARTY in *Morality and Modern Warfare*, © Helicon Press, Inc., 1960.

must be mutual respect, if not abiding understanding, between a Secretary and the Chief of Staff of a service, Henry Stimson's *On Active Duty* provides examples both of the evils that may occur when such rapport is missing and the positive virtues that result when the relationship is such as existed between Mr. Stimson and General George C. Marshall. There is no reason to be less than hopeful that the relationship between Mr. Stahr and General Decker will be as fruitful. Certainly General Decker's career attests a high respect for the scholarly and a sophisticated appreciation of the role of a Chief of Staff in his relations with the Secretary of the Army. And Mr. Stahr will certainly find in General Decker an officer of great professional competence and strong mental and moral powers.

● All the indications suggest that the new administration will frown on the sentimental and the doctrinaire. If this is true it would appear that neither weeping over glories long departed, nor stubborn adherence to involved theory expressed in scholarly obscurantism, is likely to be kindly received. The hunch here is that the way to get ahead in the next four years is to be pitiless in examination and analysis, factual, flexible and above all practical. If this sounds Utopian, let's not forget that the art of the possible is a first principle of practical politics, and in the art of government to fall short when you shoot for the stars is not necessarily to fail.

● All of the foregoing should be but the preface to consideration of the hard problems of war and peace, of military and foreign policy, of strategy and force structures, of weapons and of men that face Mr. Stahr and General Decker and their colleagues in the Pentagon secretariat and the Joint Chiefs, in the State Department, and all importantly in the White House. But perhaps in this month when we observe the birthdays of Washington and Lincoln it is enough to say that a study of history makes us less surprised that these two Americans didn't occasionally make mistakes but that they made so few. If in the decades or centuries to come, Americans will wonder not that Presidents Truman, Eisenhower and Kennedy and their Cabinet and sub-Cabinet colleagues made mistakes but that they made so few—if that becomes the final judgment of history—we who live in this era will not have failed. J.B.S.

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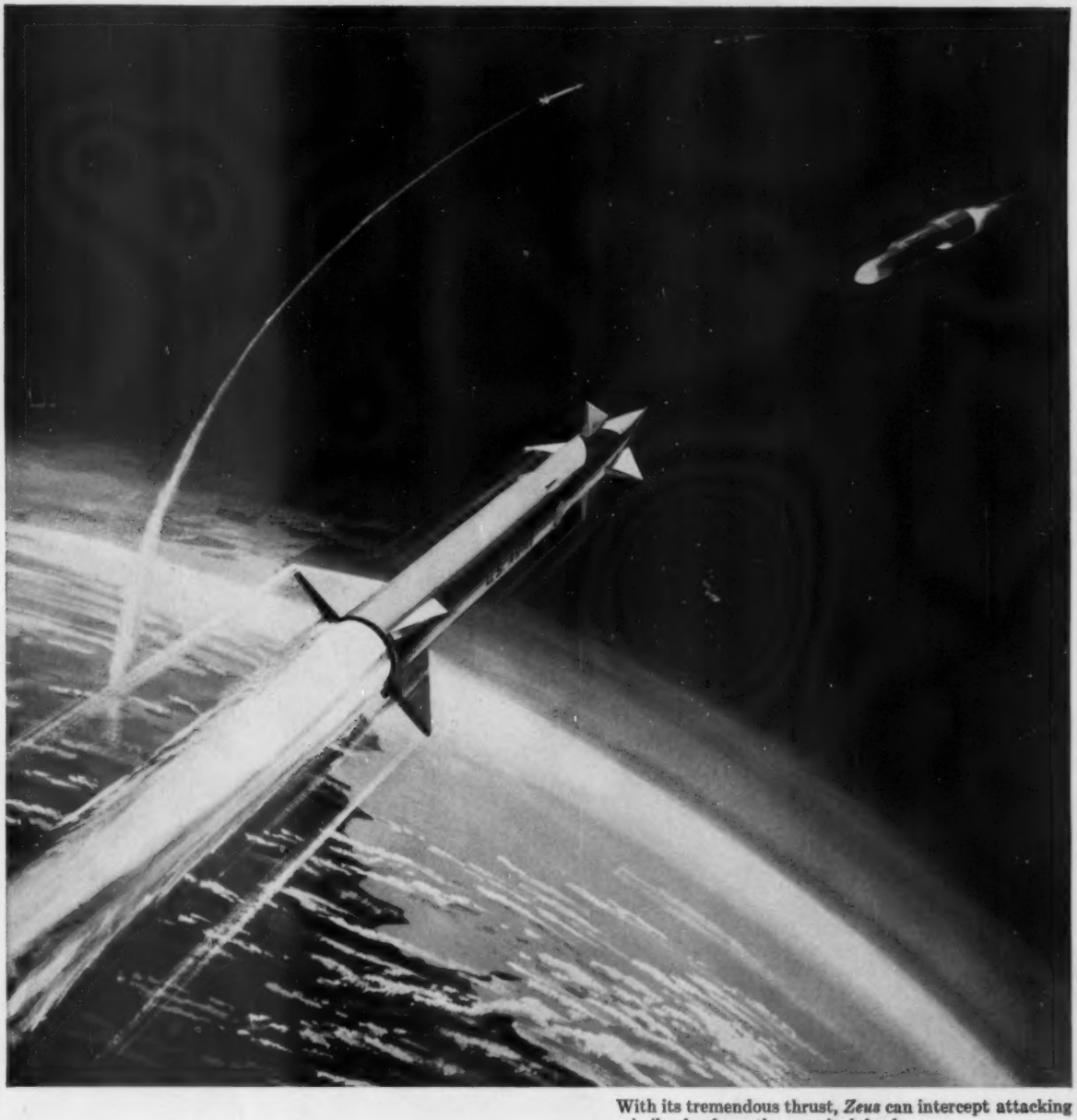

With its tremendous thrust, *Zeus* can intercept attacking missiles far from the area it defends

Army's Zeus is designed for a hit every time on supersonic bull's-eyes!

At best, an anti-missile defense will have only a few minutes to react ...and no "second barrel" to fire at its supersonic target.

Nike Zeus needs none. Tests of this new anti-missile missile show that it will attack enemy ICBM's with 100% accuracy at a distant interception point. There its nuclear warhead will be detonated to blanket the approaching ICBM with an explosive curtain.

The newest member of the famous Douglas *Nike* family, *Zeus* was developed in a joint Western Electric, Bell Telephone, Douglas Aircraft project for the Army. Its design combines the most successful lessons learned from *Ajax* and *Hercules* —*Nike Zeus* predecessors that are on duty around many important U.S. cities and industrial centers and with NATO forces overseas.

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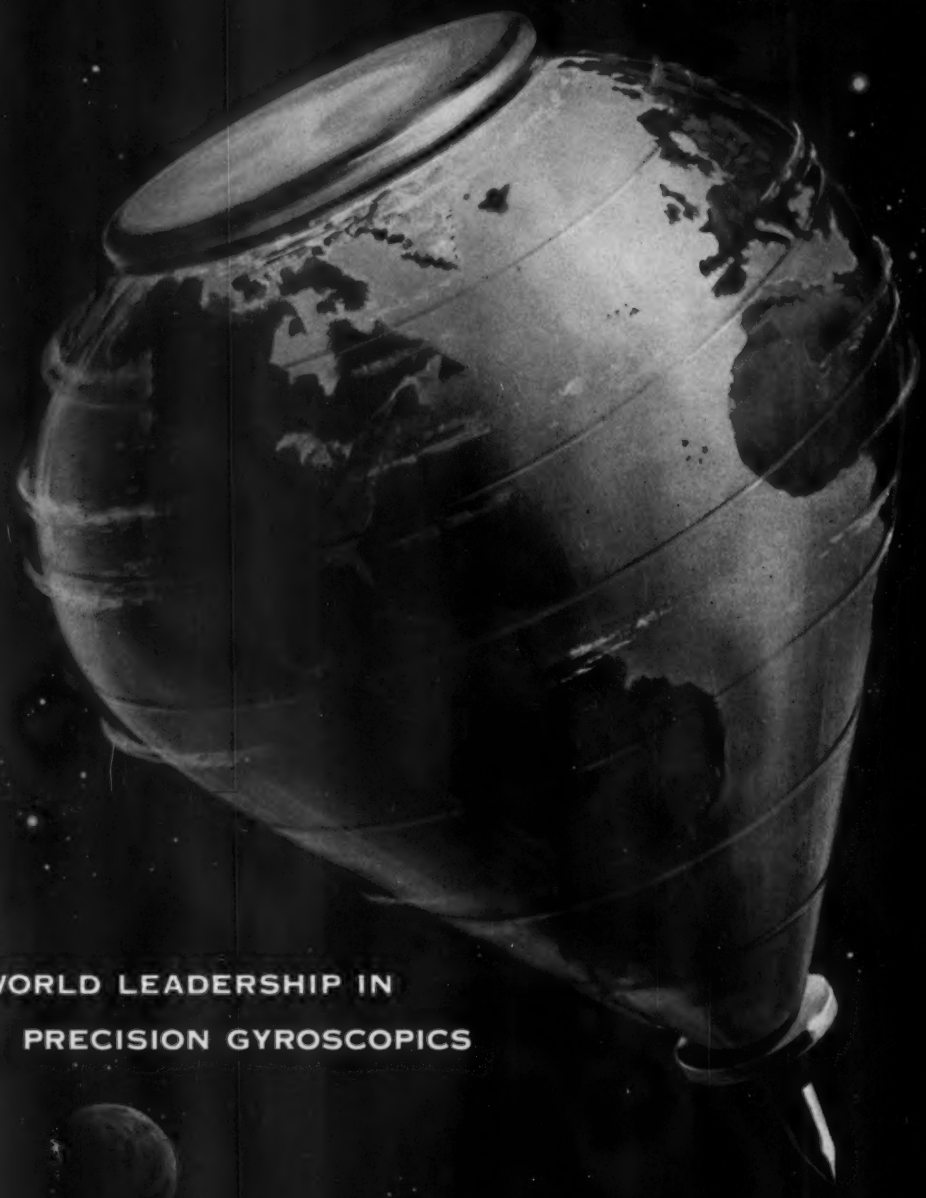

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NIKE ZEUS

WHERE NORAD STANDS

NORAD's Chief calls counter to ICBM most immediate and pressing need in air defense of CONUS

In considering what it calls the aerospace defense requirements of the 1960s, the North American Air Defense Command (NORAD) has supported the need for an antimissile missile. The following is the position of NORAD as expressed from time to time by its Commander in Chief, Lieutenant General Laurence S. Kuter, USAF. —THE EDITORS

IN aerospace defense we stand on the edge of the sixties, facing the air-breathing threat of today and looking forward to a tomorrow that holds the certainty of an ICBM threat, and not far distant, the requirement to defend against hostile satellites.

It was but ten years ago that we actually embarked on an active air-defense program. It was in August 1949 that the first mushroom cloud blossomed behind the Iron Curtain signalling an end to U. S. atomic-weapons monopoly. Russian atomic-weapons ownership coupled with the initiation of the Korean conflict dispelled any doubts about the need for an effective air defense.

In the decade since 1950, planners have persevered. Requirements for weapons and systems were planned and stated. Planned improvements were invented, designed, developed, built and placed in the hands of people trained to get the most out of them.

Today our current air-defense system has a respectable degree of capability against the air-breathing weapon threat. This system, under the operational control of the North American Air Defense Command, has resulted from a pooling of the best talent that the Army, Navy, Air Force, the Royal Canadian Air Force, and industry could muster.

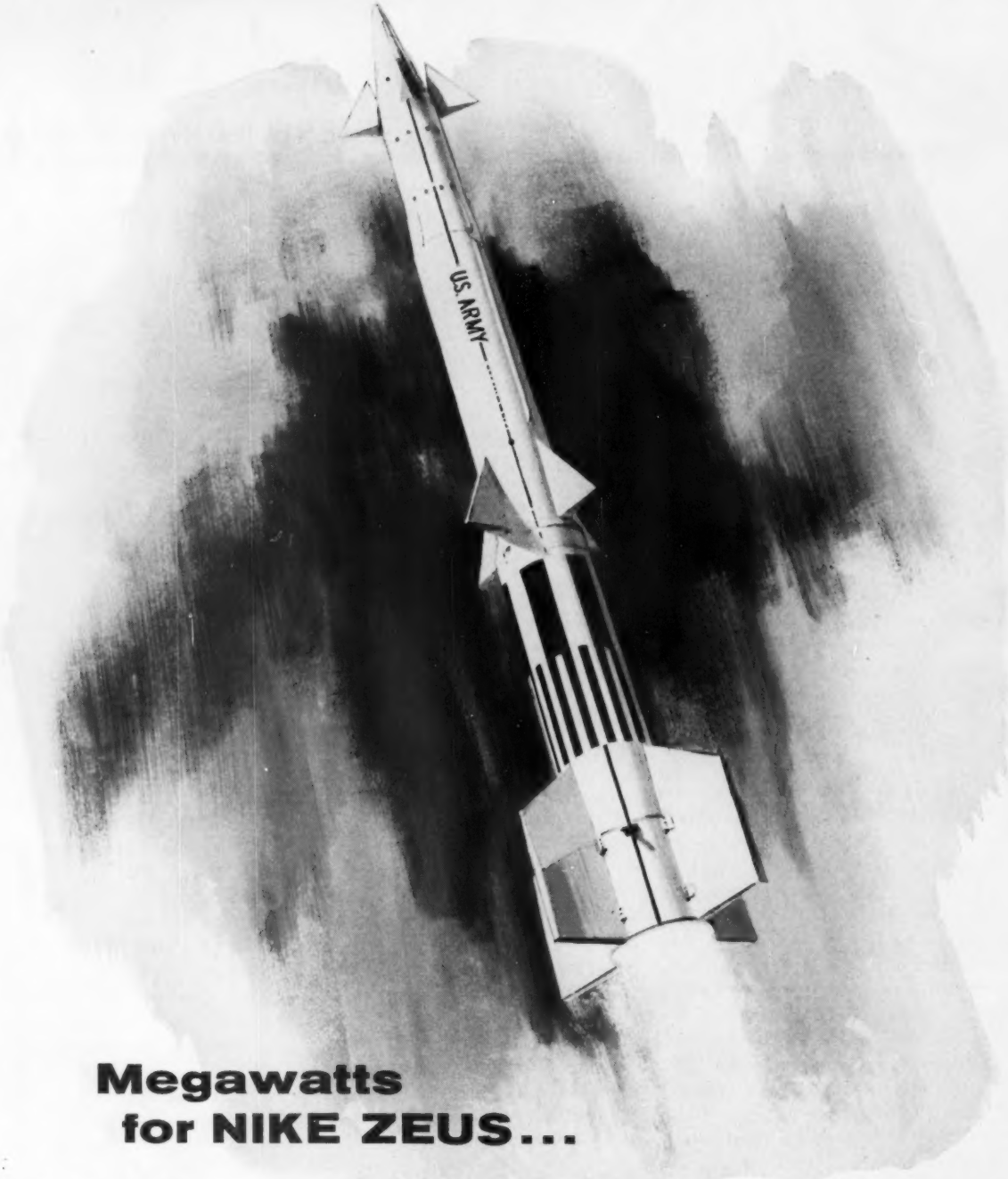
However, now our most immediate and pressing requirement in aerospace defense is for a counter to the intercontinental ballistic missile.

At the present time, the most advanced project under way in this critical area is being conducted by the Army on the Nike Zeus system. This project has experienced considerable success in its research and development program. The Department of Defense has announced future firing tests of the Zeus against ICBM targets of the Atlas and Titan types. NORAD hopes that these tests will produce successes which will result in a decision to initiate production.

Additionally, the respective successes of the United States and the Soviet Union with satellites cast a shadow of significant portent. In order to avoid a future gap between our defensive capability and Russia's offensive capability similar to the present gap between our capability to defend against the Russian ICBM and their offensive ICBM capability, we must attack the problem of satellite defense with no less talent and vigor than the Russians are putting into their satellite program.

In aerospace the established defense functions of detection, identification, interception, and destruction must close the gap between the exploding perimeters of the over-all aerospace concept.

NORAD believes strongly that an acceptable degree of aerospace defense not only insures survival if deterrence should for any reason fail, but will provide the only effective deterrent if and when parity is established between offensive forces. NORAD is dedicated to the proposition that we shall be first to produce an acceptable degree of aerospace defense.



Megawatts for NIKE ZEUS...

With a booster of over 450,000 pounds of thrust, NIKE ZEUS will need still another form of power to fulfill its anti-missile assignment. This other power is in millions of watts – energy for the system's extended range target tracking and discrimination radar transmitters.

Developed for the Army by Sperry out of its long experience in high power radars, and employing giant-wattage Sperry klystron tubes, the target tracking transmitters will permit greater-than-ever capability for radar tracking of "hostile" targets. The discrimination radar is designed to classify targets according to the nature of the threat.

NIKE ZEUS – the nation's only anti-missile missile system now in the advanced development stage – is undergoing R&D and pre-production programming under the Army Rocket and Guided Missile Agency (ARGMA) cognizance, with Western Electric as prime contractor and Bell Laboratories responsible for the overall system. It is the only missile system now in development for intercepting ICBM's . . . to defend our cities and defense sites.

SPERRY

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NIKE ZEUS

THE NEED

Lt. Gen. ROBERT J. WOOD

If the Mr. K behind the iron curtain is increasing his ICBM's "like sausages," our Mr. K should be able to destroy them every day in the week—and with Zeus ARADCOM will be able to do so

IN our time, the leader of a great power boasts, in one breath, of rockets that can deliver nuclear destruction to any point in the world; and, in the next, he threatens to "bury" us. Then, evidently with a mind to lulling us into wishful thinking, he tells us that he means only to bury us in the sense of overwhelming economic competition. He adds the assurance that our grandchildren will live under the red flag of communism.

He hurls loose words across the world, rattling his rockets should we intervene in Cuba. Acceptance of Communist backing by Castro implies also a possibility that Cuban waters could become a haven for hostile, missile-carrying submarines, or even that land bases for missiles could be established. Here is a stark reminder of the reality of our peril, and how close it is to home.

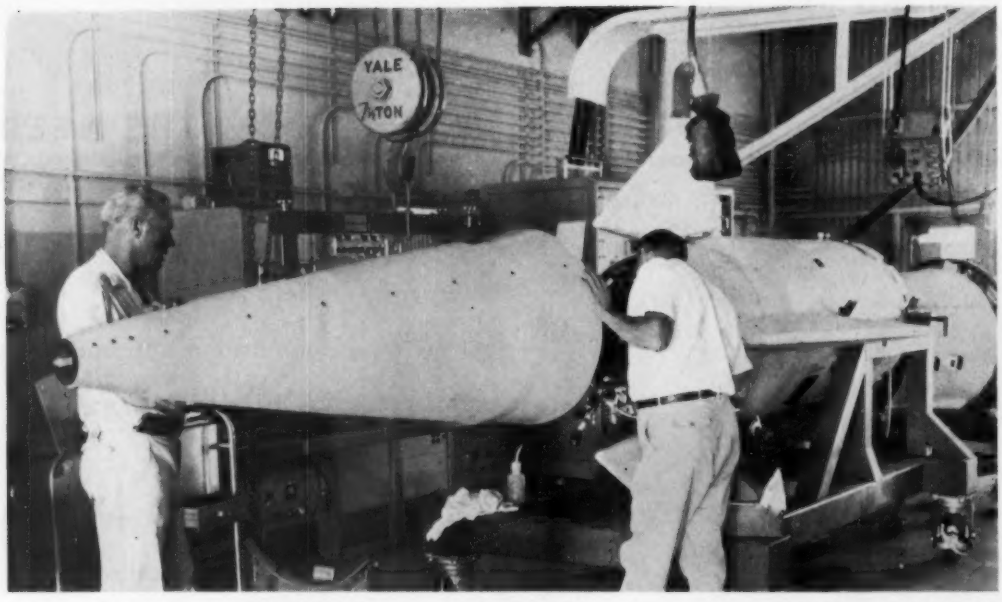
It is clear that the Soviet Union has actually developed missiles that can deliver megaton-yield nuclear warheads to any point on the North American continent. In a very few years, as the Soviet ICBM becomes available in quantity and improves in reliability and accuracy, it will probably replace the bomber as the principal threat to our continent. In the light of our knowledge of Soviet armament doctrine, its stocks of missiles can be expected to increase as rapidly as sausages, to paraphrase a remark by Mr. Khrushchev.

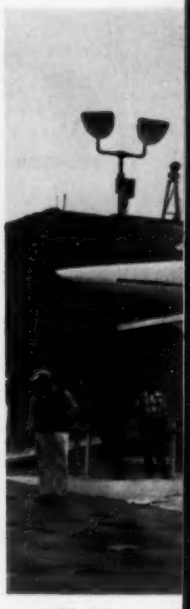
The weight and size of the Sputniks and Luniks have demonstrated an ability to launch payloads in the multi-megaton range. The Pacific ICBM shots have demonstrated a Soviet capability of sending a missile to a distance of 6,500 nautical miles—more than long enough a range to reach any target in North America. These, and other shots, indicate possession of a guidance and control system adequate to achieve reliable accuracy.

This ICBM threat will not be *substituted* for the manned bomber threat; it will be *added* to it. In fact, there are many reasons for believing that, characteristically, the Soviets are telling less than the whole truth when they seek to give the impression that they have stopped developing bombers. In fact, they are not only retaining the bomber; they are improving it.

In addition to an ICBM and an improved bomber capability, the Soviet Union also can launch surface-to-surface missiles from long-range submarines. This submarine-launched system can be expected to improve with Soviet development of missiles of the Polaris type. While anti-submarine warfare is a Navy mission, the defense against missiles launched against our land, whether fired from a submarine or otherwise, becomes an air-defense problem.

Similarly, any space device becomes an air-defense problem. Without attempting to prejudge the merits of space-based defense systems, it appears essential that we have a system that is land-based, land-oriented and designed to defend the land areas on which we live. Such a *terra-space* system will enable the man on the ground to





No margin for error as the Nike Zeus goes through firing preparations at White Sands Missile Range, N. M. At left, technicians carefully join component parts of the Zeus warhead in the assembly building. Each section is handled separately and joined immediately prior to firing. Center photo shows final assembly of the Zeus under open skies. Douglas Aircraft, Western Electric, and Bell Telephone Laboratories, leaders of the indus-

obtain maximum benefit from the many advantages which are his in the battle against his adversary in the air or in space.

The demonstrated growth potential of the Nike system, the soundness of the command-guidance rocket concept, and the record of solid achievement amassed by the Ordnance-industry development team lead to the conclusion that Zeus will similarly have substantial growth potential. Although designed primarily as a defense against ballistic missiles, this system can be improved to defend successfully against space or satellite threats.

ARADCOM's needs and aims

While USARADCOM, together with its NORAD comrades in arms, now possesses a reliable defense against the aerodynamically supported threat, there exists a compelling need to establish timely defenses against future missile menaces.

It is reasonable to assume that the Soviets now are able to develop a defense against our ballistic missiles—the same missiles on which we are principally relying to deter Communist attack. Consequently, we may be engaged in a deadly race, in which the winner carries off a prize of military and diplomatic advantage.

As Saint Paul admonishes the Corinthians, we must, therefore, "so run as to obtain it." In this race, there is no prize for second place.

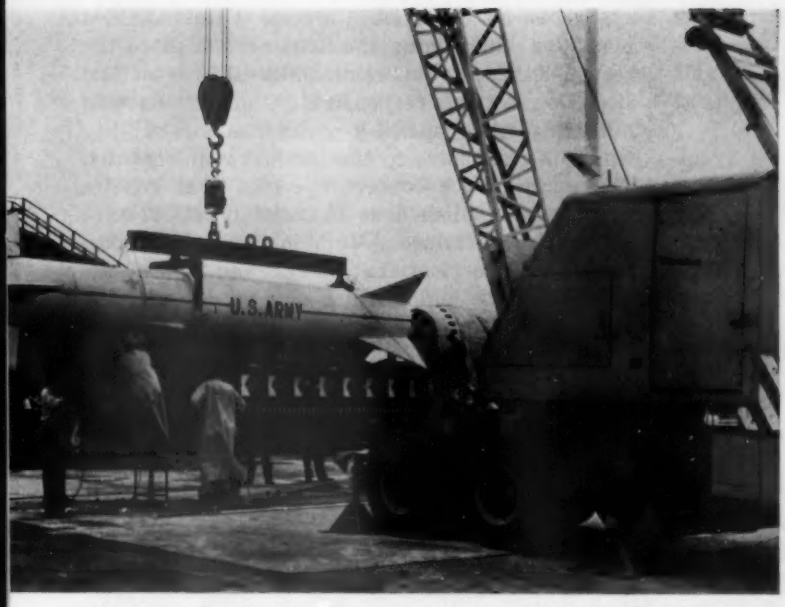
I am hopeful to the point of confidence that the Army's Nike Zeus will prove to be a reliable defense missile, and we in USARADCOM are watching its development with great interest. The feasibility of destroying one missile with another has been adequately demonstrated through the destruction of Honest John, Corporal and Hercules by air-defense missiles already in our inventory. The command-guidance principle has been proved, the team which is developing Zeus has demonstrated the ability to develop systems with great potential for growth; and the missile and its propulsion system has been tested successfully. Other elements are being developed and tested at an astonishing rate.

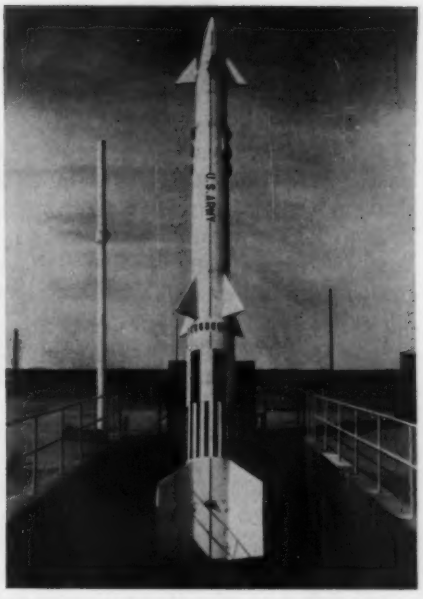
Deterrence is a state of mind. In weighing the problem of when and where to attack the Free World by military means, the Soviet leaders must take into account both the offensive and defensive capabilities of the Soviet Union and the Free World. They must ask themselves two critical questions:

- To what extent will a Soviet attack on the Free World succeed?
- To what extent can the USSR defend against Free World retaliation?

The existence of a reliable missile defense by the United States would greatly influence the answers to both questions in our favor, and would constitute an important element of deterrence.

If deterrence were to fail, and if the enemy were to launch a military attack against us, the mere capacity to retaliate would not ensure our survival. On the other hand, reliable air and missile defenses would enable our nation to survive with





try team developing Zeus, are in charge of the Army's test firing program. At right, the Zeus looms tall against the New Mexico desert as it rests in launching position on the pad. All Zeus firings, to date, have been called "successful" and the Army-Industry team is confident that Zeus is the answer to the enemy intercontinental ballistic missile threat. Zeus will try "kills" against Atlas ICBMs over the Pacific Ocean.

sufficient resources ultimately to impose our will on the enemy.

ARADCOM will have Zeus ready

The United States Army Air Defense Command will be ready to assume responsibility for operating the Zeus ballistic missile system. In less than a decade, USARADCOM has accomplished the transitions from guns to Nike Ajax to Nike Hercules while maintaining active air defenses commensurate with the threat.

The experience we have gained in the fields of command, organization, logistics, training, and intelligence constitutes the basis for USARADCOM planning regarding Zeus.

It is well recognized, however, that successful operation of the Zeus system will require much more than mere extrapolation of Ajax and Hercules concepts. But the problem-solving organization exists in USARADCOM, and, more important, the *will* to solve the problems is constant and determined. Planning for Zeus integration in continental air defense began shortly after the Zeus project was established early in 1957. Planning, while detailed and complete, has necessarily been flexible.

With the experience of deploying and siting Nike Ajax and Nike Hercules under their belts, USARADCOM planners have developed measures for various degrees of Zeus defense. USARADCOM plans have been coordinated with those of the North American Air Defense Command (NORAD), so as to assure the most effective use of the promising Zeus system. Included are USARADCOM plans for accelerated deployments to high-priority defense areas.

Reservoirs for Zeus training

Training standards, which are already high in the Nike Ajax and Nike Hercules systems, necessarily will have to be even more demanding for Zeus. The compelling importance of the system and its complexity will allow room for only the most competent crews. Thorough and detailed on-the-job training will be required to maintain peak proficiency in the skills essential to Zeus operation. The need for 24-hour-a-day operation imposes additional burdens. The urgent requirement to get the system in operation at the earliest possible moment necessitates that fully trained crews be ready when the equipment is delivered. USARADCOM has maintained constant coordination with CONARC and with the U. S. Army Air Defense School in developing training plans which will ensure that capable artillerymen will be ready to man the Zeus system when it is delivered. Selected USARADCOM soldiers are presently undergoing a course of training at White Sands Missile Range, under the Army Ordnance Missile Command, that will qualify them to take their places alongside personnel from Ordnance, CONARC and industry during the forthcoming combined engineering service tests. These tests will

be conducted at White Sands Missile Range, at Point Mugu, California, and on Kwajalein. Experience gained during active test participation will then be available to USARADCOM for command and operation of the Zeus system.

Fortunately, the Army has two additional great assets which will facilitate training for Zeus. The first is the existing reservoir of trained Nike crews who can readily achieve the high degree of competence required for Zeus; the second is the existing highly effective training system at Fort Bliss.

Regarding on-site training, the USARADCOM view is that training of crews and on-site evaluation of men and materiel must be a continuous, unceasing effort that is conducted while maintaining an acceptable operational capability. Inherent in USARADCOM planning is the on-site use of training devices and simulators to augment tactical equipment. While operation of the Zeus system will be simplified through the use of built-in exercising and check-out equipment, an extraordinarily high degree of skill will be required to adjust, raise to peak efficiency and maintain the highly complex Zeus system.

To perform its function properly, the Zeus system must be maintained continually in an operational status. With only 15 minutes, or even less, warning of an oncoming missile attack, there will be a premium on the immediate availability on-site of maintenance personnel fully qualified to make whatever repairs are required to return the system to an operational status. USARADCOM plans for maintaining the Zeus system place the responsibility on the commander at the tactical site. To meet this responsibility, he must have at his immediate disposal a maintenance capability which is responsive to the tactical requirements. The maintenance concept specifies that repairs will be accomplished as close as practicable to the origin of failure. [Maintenance will be performed at two locations: on-site and depot (off-site).] On-site maintenance will be done by the unit's maintenance technicians and technical services repairmen. Off-site maintenance will be performed by technical services or industry personnel at a technical services depot or a manufacturer's plant.

Soldier-civilian test team at Nike Zeus launching site makes last-minute checks before a shoot. Manning the portable test set, civilian at left adjusts warhead while soldier stays in constant communication with the control center at blockhouse.

Air Defense School planning

The Air Defense School is an old hand at training officers and maintenance technicians in surface-to-air missile systems. Since 1952, more than 400 Nike batteries have been created and almost 25,000 technicians have been trained.

Preparation to teach any new air-defense weapon system requires these steps: first, a study of the materiel during its research and development phase; second, preparation of training programs and training literature in the form of textbooks, wiring diagrams, descriptions of working mechanisms, and so on; third, the training of instructors; fourth, the teaching of students.

We can gain an insight into the training requirements for Nike Zeus by studying training requirements for Nike Hercules. Training for Hercules, which is much less complex than Zeus, required school courses as long as 43 weeks. Zeus courses will not be appreciably longer than those for Hercules, but their preparation will take considerable time.

The School's Zeus training activity began with the integrated training plan in 1958. This was prepared by the School, coordinated with USARADCOM and appropriate technical services agencies, and subsequently approved for planning purposes by Department of the Army. The plan describes, in detail, the types and numbers of students required for Zeus training courses, the course lengths, and the special considerations of Zeus training.

One of the most significant special considerations concerning Zeus training is that tactical systems will not be available for resident instruction at the school. Since training of students at the tactical equipment itself is highly desirable, the lack of equipment dictates that training be conducted in two major phases.

The first phase, to be conducted at the Air Defense School, will provide the base of knowledge required for appreciation and continuation

of training at the tactical equipment itself. Training aids, equipment simulators, and portions of tactical equipment will be used to teach the required basic technical knowledge and skills.

The final phase of training, that conducted on-site, will take the student's knowledge from training devices and translate and relate it to the tactical equipment. This phase will continue during the contractor's installation and test of the tactical equipment.

To provide definitive knowledge of personnel requirements and to assist in developing training courses, a task and skill analysis is now being conducted. This comprehensive study defines each technical task involved in operating, maintaining, and supporting the Zeus system. With each task defined, a training-aid feasibility study is possible, and that is now also in progress. This study identifies the various types of training aids particularly suitable for teaching the required subject materiel. From this knowledge of skills and feasible methods, the School can, with economy and efficiency, accomplish its training mission.

Specialization fields

Complexity, size, and greater geographical separation of elements of the Zeus system will require that the maintenance crews be more highly specialized than those of previous Nike systems. Specialization of maintenance technicians will be in five general fields: missile and associated equipment, digital computer, acquisition radar, tracking and discrimination radars, and data control and tactical monitoring.

For a student with no previous related training, each of these fields will require a total (resident and on-site) school training time of approximately one year. Students with appropriate, or prior Nike, technical background may be equally well trained in about nine months. A relatively small number of technically trained and experienced career warrant officers will be selected for training as maintenance supervisors. Their training will include all facets of maintaining the Zeus system and will require about 18 months.

Officers being trained for Zeus duties will attend courses similar in scope and duration to those which have served Nike units so well in the past.

A key factor in the Zeus training program is the timely availability and full capability of a staff and faculty to execute the training plan. The School created the nucleus of its Zeus staff and faculty in May 1959, when the Zeus Division was organized under the Deputy for Combat Developments and Research. The Zeus Division has been actively building an organization, developing training plans, participating in research and development testing, and keeping in close technical liaison with system developments at manufacturers' plants. At the appropriate time, a Zeus academic department will be formed, with the mission of executing the training plans. Within a few weeks after this department's activation, key instructors will begin extensive training at contractors' plants. Staff and faculty remaining at the School will prepare technical training literature, install and test training devices, publish course material, and put the final touches on the training program in preparation for the first class of students.

Signal Corpsmen do cable splicing job between the Zeus Acquisition Radar (dome at rear), and the battery control area. Ground control is the most expensive part of the Zeus system.

USARADCOM and the School are ready to press ahead with the Zeus program, realizing that lead time for preparing plans and instructional material is as important as the lead time for developing materiel itself.

LIKE the runners referred to by Saint Paul, USARADCOM and the U. S. Army Air Defense School are training for the race. With reason for believing that the enemy likewise is developing a missile defense, both Army agencies are determined to win. At stake is the prize of Freedom; there is no second prize.

NIKE ZEUS

THE CONCEPT

Maj. Gen. AUGUST SCHOMBURG

With Zeus the expensive "thinking" is done on the ground while the missile thrusts its way to ICBM kill

IN Nike Zeus, the only anti-ICBM missile system in advanced development on the sunny side of the Iron Curtain, the Army believes it has the answer to Soviet ICBMs. Now undergoing component tests, Nike Zeus is designed to mount its defense against attacking ICBMs in a matter of seconds. The whole operation will be as precise as a Swiss watch and as automatic as a housewife's washing machine. Here is the concept of Nike Zeus:

Zeus command guidance

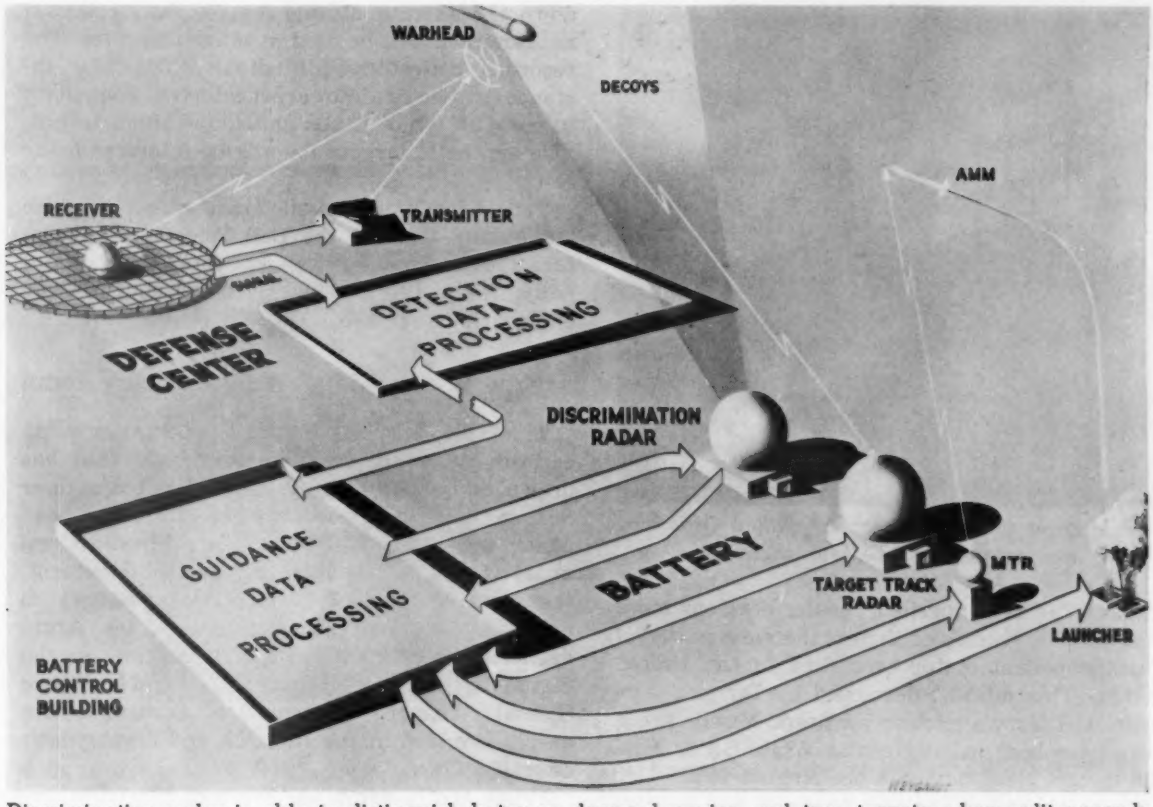
The Nike Zeus system uses the command guidance principle. This places the costly and complicated control equipment for the missile on the ground. The earthbound Zeus defense center will control the intercept, guiding the defending Zeus missile with control orders: turn left, turn right, detonate.

Assume an enemy ICBM warhead is headed for an area being defended by the Nike Zeus system. A typical engagement would work like this. First, the Zeus system gathers data. Scanning space in all directions, at a rate of some millions of cubic miles a second, the Zeus acquisition radar can detect small objects hurtling through space hundreds of miles away.

Two separate units compose the Zeus acquisition radar. The transmitter, with its enormous triangular antenna whirling atop the transmitter building, sweeps the sky with its signal. When the signal strikes an object out in space, it bounces back to the acquisition radar receiver, which turns synchronously with the transmitter antenna.

The receiver antenna is a Luneberg lens, which functions much like a magnifying glass. As the radar signal returns to the receiver, the Luneberg

Zeus system noncom sits in Olympian scrutiny of blockhouse TV and control panels during dry-run test firing at White Sands of Zeus antimissile missile



Discrimination radar is able to distinguish between decoy dummies and true targets when split seconds count. After true target is identified, target track radar locks on and guides Zeus to incoming enemy missile

lens puts it into focus and concentrates it at a detector. Using information collected by this radar, Nike Zeus computers can almost instantly determine the track of incoming objects and predict the resulting impact point.

Once acquired by the acquisition radar, the target will also come under surveillance of a discrimination radar. It will supply the precise information required to separate the real warhead and its lethal cargo from decoys and false targets that an attacking ICBM might eject to confuse the defense.

The brains of Zeus

When an incoming object is designated as a true target, it will be automatically switched to the Zeus system's hyper-accurate target track radar. This will track it until it is intercepted and destroyed. As the TTR gathers information on the target, it feeds it to the target intercept computer—the brains of the system.

Calculating and digesting the data in fractions of a second, the computer keeps track of the quarry and figures ahead to determine when a Zeus missile should be launched to intercept it.

In the meantime, one of the many missiles in a Zeus battery has been selected for action. A missile track radar near the launching area has automatically locked onto the defending missile, follows it from its launching cell all the way to intercept, whether within or outside the earth's atmosphere, constantly feeding it instructions as it goes. At the exact instant dictated by the target intercept computer, the missile is instructed to detonate. It neutralizes the ICBM warhead without damage to the defended area.

Orders to the missile are given in such a way that only the Zeus missile for which they are intended will receive them. Many Zeus missiles can be in the air at the same time, each on the way to its own intercept, each obeying control orders meant for it alone.

The entire operation will be completely automatic, from detection through intercept. Throughout the engagement, which will take place in brief minutes, information will be processed with lightning speed by the Zeus computers. These specially designed data processors owe their high speed to tiny switching transistors and a "twistor" memory. This new development can pass stored information into the system in millionths of a second. Both the transistor and twistor are examples of the many technical breakthroughs that have made feasible a system like Nike Zeus.

The Nike Zeus missile has three solid propellant

Diesel power unit gets check by skilled Ordnance noncom prior to Nike Zeus test firing

stages. The Zeus missile's booster develops more than 450,000 pounds of thrust, the most powerful solid propellant motor ever fired in the United States. This missile, developed by Douglas Aircraft, will carry a nuclear warhead. Missile firing tests have been in progress at White Sands Missile Range, New Mexico, since August 1959.

Other phases of the test program will be carried out simultaneously at four major sites: White Sands; Point Mugu, California; Kwajalein Island in the Pacific; and Ascension Island in the Atlantic. These phases will provide maximum data feedback for the development effort and to compress it into the shortest possible time.

Complete Nike Zeus systems are being installed at White Sands and Kwajalein. At White Sands, the target intercept computer, acquisition, missile track and target track radars are now installed and are being readied for testing.

Radar, missile and guidance packages and some other Zeus system components will be tested there.

At Kwajalein, a complete Zeus complex is being installed for full system tests against actual ICBMs. From that tiny island far out in the Pacific, Nike Zeus missiles will be fired and controlled to intercept Atlas ICBMs fired as targets from Vandenberg Air Force Base in California.

At Point Mugu, a missile track radar and target intercept computer are being installed for use in missile firings down the Pacific Missile Range. These tests will be extensions of those at White Sands, where range limitations preclude testing of the complete missile and its guidance and control systems.

A target track radar has been installed on Ascension Island and will soon begin tracking actual ICBMs fired from Cape Canaveral, Florida, down the Atlantic Missile Range. Data collected at Ascension will be used at other test sites. The recorded trajectories of actual ICBMs, for instance, will be fed into target intercept computers in tests at White Sands and Point Mugu to provide synthetic targets for missile intercept firing tests.

Target track and missile track radars are also undergoing tests at the Bell Telephone Laboratories Research and Development Center at Whippany, New Jersey, scene of much of the Zeus engineering program.

Zeus' Army-industry team

The Nike Zeus development program is being carried on by an Army-industry team that has drawn on much of the nation's top brainpower during the three years that the effort has been under way. The Army Ordnance Missile Command is system manager. A Command element, the Army Rocket and Guided Missile Agency, is exercising technical supervision. Other Army agencies, notably the Corps of Engineers, the Signal Corps, Transportation Corps, and Ordnance Special Weapons Ammunition Command are deeply involved in the research and development effort.

Prime contractor is the Western Electric Company, manufacturing arm of the Bell Telephone System. Bell Telephone Laboratories has over-all research and design responsibility. Douglas Aircraft Company builds the missile. Literally hundreds of industrial subcontractors are contributing their special talents.

The development approach to Nike Zeus has been similar to that used for the other members of the Nike family, Ajax and Hercules. These air-defense systems were developed and proved in much the same way and by many of the same people who now work on Zeus. The experience gained in almost 15 years of work with air-defense missile systems has proved an invaluable asset to Nike Zeus development.

This experienced team, building on the broad base provided by Ajax and Hercules, has brought forth a flexible design that can take full advantage of improvements in the state of the art and major technical breakthroughs to keep the Zeus research and development program on schedule.

The Army firmly believes that it has, in Nike Zeus, the best and only counter to the threat of attack with intercontinental ballistic missiles that science can produce today, and a system with the growth potential to meet the challenges of tomorrow.

Nike Zeus development is being pushed forward with high priority by the Army in anticipation of an early production go-ahead.

NIKE ZEUS

LIMITED PRODUCTION NOW

RICHARD S. MORSE

Early deployment of Zeus would crank in imponderables that would deter the enemy from striking and give time for future developments and refinements

I have no quarrel whatsoever with decisions made to date requiring further test before initiation of Nike Zeus production or to our national emphasis on massive deterrence through expansion of our ICBM program. I do think, however, that a continuing appraisal should be made of these programs, particularly at the research and development level. Continued expenditure for strategic kill weapons at a level of 40-50 times that of the research and development effort on Nike Zeus might well be reconsidered.

The problem of fool-proof ICBM defense admittedly is far from solved, particularly in the event of all-out massive attack. On the other hand a production program on the minimum scale that would permit an early deployment of a Nike Zeus would be a sound investment. Even a limited initial program would give us the know-how for later full-scale production.

A discussion of some of the considerations is in order.

In the not too distant future one or more unfriendly governments may acquire a few IRBMs or ICBMs against which even the present Zeus concept would offer a degree of real defense. Moreover, the complexity of early warning and launching systems is such that technological mistakes may very well trigger an inadvertent missile firing. An operational Zeus system would afford protection against such missiles and might prevent such incidents from resulting in war.

In many respects disarmament appears to offer the only alternative to world destruction. Yet prudence will not allow us to completely drop our guard against defects of inspection or the continued threat of a limited number of ICBMs. Zeus would render more acceptable a program which otherwise would be unacceptably dangerous.

If only to buy time—and after all, time is the only commodity of real significance these days when we no longer have the clear-cut technological production superiority in all fields—the Army believes it is highly desirable to initiate an early interim production program on Nike Zeus prior to completion of the Kwajalein tests. Such a program would be sufficiently flexible to permit design changes over the long period of time between production and final deployment and to allow full application of changing technology to the ultimate systems.

An early decision to produce and deploy, even on a limited scale, would have a significant impact on enemy planning, introducing imponderable factors which would seriously complicate his estimates of our defensive and retaliatory capabilities. I am sure, also, in terms of cold war psychology, that realization on the part of the free world that the United States was, in fact, proceeding with active defense against today's principal weapons of massive destruction would do much to weight the scales of opinion against the Soviets.

It is my opinion that we should start a limited early production of Zeus now . . .

NIKE ZEUS

MANAGING THE DEVELOPMENT

Brig. Gen. JOHN G. ZIERDT

Key figures in the Nike Zeus development program: Brig. Gen. John G. Zierdt, CG, ARGMA; Maj. Gen. August Schomburg, CG, AOMC; and Lt. Col. Glenn Crane, Zeus Project Director

Long-range scheduling and management put Zeus on the right track from concept to today's go-ahead stage

THE real test of any management system is how well it does the job. Our classified master schedule tells the story for the Nike Zeus anti-missile missile system. It was prepared in 1956, when Nike Zeus was in the feasibility stage. All of us engaged in Zeus management keep that chart close at hand. It presents, in a month-by-month record, the over-all program that was proposed almost five years ago when we were looking down the road to the time the Zeus system would be operational.

All the postings that reflect progress since the chart was drawn are in the right place. We are determined to keep them in the right place, to keep this program, whose scope is as great as any development job ever tackled in this country, on schedule.

We are meeting essentially the schedule we set up in those early days of the program.

Our long-term goal is to provide the United States with a defense system to counter the threat of hostile intercontinental ballistic missiles.

The immediate goal, however, is a full-scale system demonstration of actual missile-to-missile encounters to prove the feasibility and practicability of the Zeus system. We plan to use as targets Atlas ICBMs launched by the Air Force from Vandenberg Air Force Base. We intend to prove that the Zeus system can defend the people of the United States against ICBMs.

Any way you look at it, the management problem associated with Nike Zeus is a formidable job. It is an extremely large program, in dollars, people, and agencies. It is a program that deserves and lays claim to the best minds and best organizations in the nation. It uses a true Army-industry team working closely together. Our industrial contributors form a contract structure that includes hundreds of major plants and thousands of small manufacturers and suppliers throughout the United States (see pages 48-49).

In addition, virtually every major agency of the Department of Defense is involved in some portion of the Zeus program. Participation of the Departments of the Air Force and Navy as well as most elements of the Army is required—not just the Ordnance Corps, but all the technical services and large groups of the combat arms. Separate government agencies, such as the Atomic Energy Commission, are also involved.

The Army's system concept

Our Zeus management structure has to quarterback the team effort to keep the program moving on its high-priority schedule and pointed in the

correct technical direction, and to live within the funds allotted to us to do the job.

To understand the Army's management approach to Nike Zeus, go back 15 years to the initiation of Nike Ajax, the nation's first major guided-missile system development program. The system management approach to missile weapon systems development, conceived by the Army-industry team and started with Nike Ajax, provides the basic framework for the Zeus program. It set the pattern for such an approach. It has been used for other weapons programs supervised by the Army Ordnance Corps.

The Army Ordnance Missile Command, specially organized and given the authority, provides control for the resources available to the Army for its missile system programs. Thus, Major General August Schomburg, Commanding General of AOMC, is the Army's system manager for the over-all Nike Zeus development.

Under General Schomburg is the Army Rocket and Guided Missile Agency, exercising technical supervision of the program. Acknowledging the magnitude and urgency of Nike Zeus development and associated planning efforts, the commander of ARGMA has established, at the level of a deputy commander, the position of Project Director, Antimissile and Space Defense.

Widespread delegation of authority has enabled this officer, Lieutenant Colonel Glenn Crane, to give his full time and energies to ballistic missile defense needs. His prime responsibility is the execution of the over-all Nike Zeus effort, including development and projection of plans for support and possible production efforts.

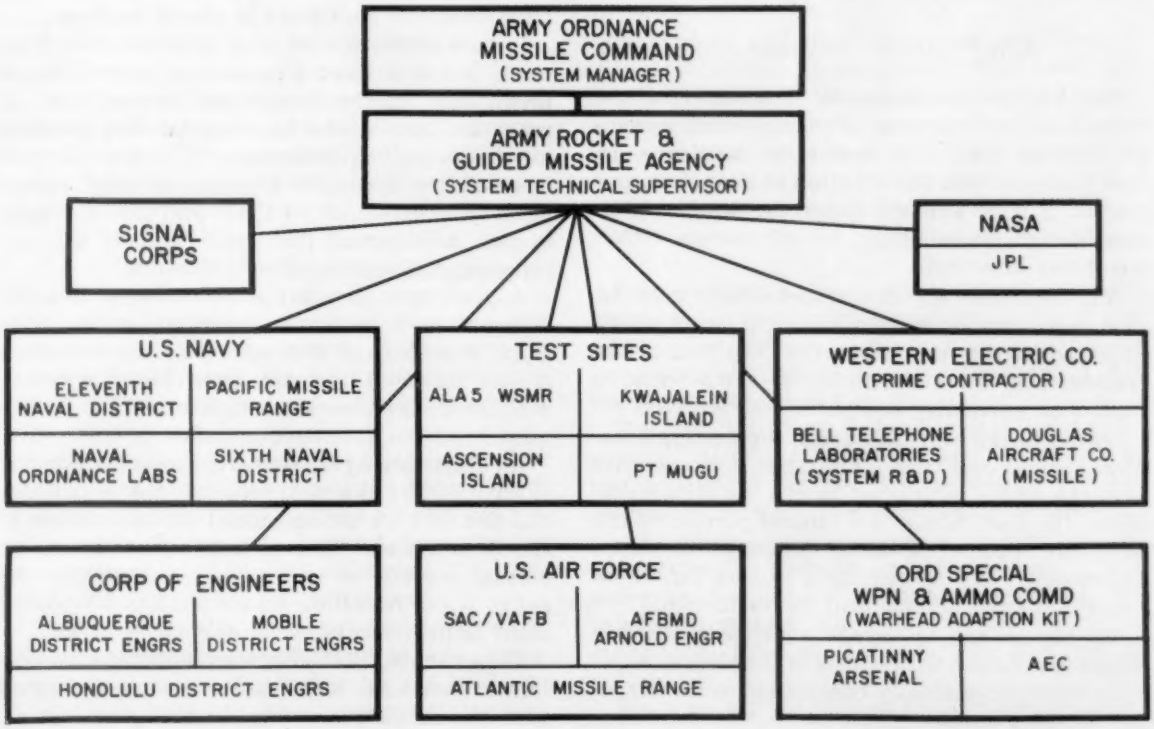
Within the Army-industry team, the Army retains top supervision and control of program objectives, funding, and managing. The Army decides what military characteristics the system must have. We hold broad technical responsibility to see that the weapon system as a whole meets Army requirements. The Army also retains warhead development within the government.

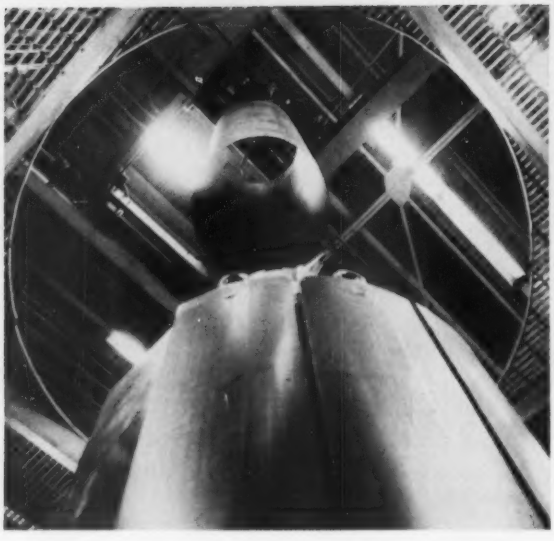
Large-scale solid propellant production activities such as those required for the Nike Zeus missile are traditionally held within the Army or under its direct control in government-owned, contractor-operated plants.

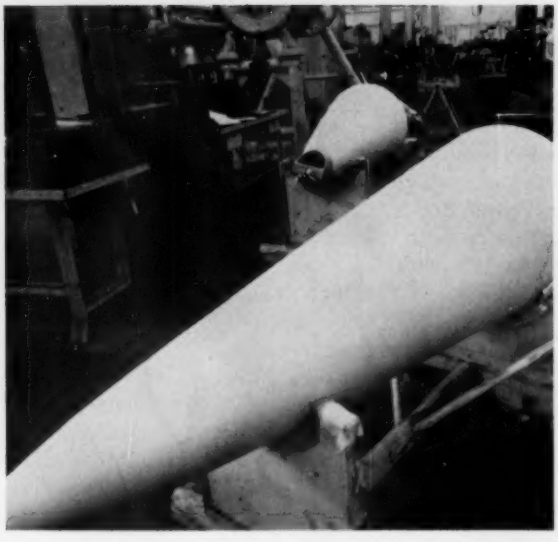
The Army also provides the large, specialized test ranges and other special facilities with coordination of peculiar technical or logistic support that our contractors may require.

An example of this is the arrangements for use of large, government-owned wind tunnels and special logistic support at remote test sites. We

How ARGMA manages the far-flung research and development activities of Nike Zeus







Nike Zeus shaping up at Douglas. Army photographer, Lt. Cecil Stoughton visited Douglas Aircraft Company plants in California for these photos showing (from left to right) a missile skin being shaped in a

maintain an Army in-house technical capability more accurately to judge and assist development of some of the technical proposals that come to us. The lion's share of the development effort, however, and about 90 per cent of the program dollars, are contracted to the industrial partners in our Army-industry team.

Army system contract philosophy

The key to the successful utilization of the system contract method of management we employ in the Nike Zeus system is the degree of care that goes into the selection of the prime contractor. It is he who will assign the detailed technical design responsibility he will pursue within our Army directives.

Any candidate for this responsibility must be able to do a major share of the total development effort within his own resources. The prime contractor must have the technical competence to control an expanding subcontract structure.

Owing to the ever-increasing engineering complexity and acute time limitations, it is essential that the prime contractor have a multiple capability. He must fabricate a critical portion of the hardware required to record system performance successfully, and to provide a smooth but rapid transition from development to production.

We always try to engage a prime contractor whose association with efforts in the civilian economy would be mutually supporting in respect to our military needs.

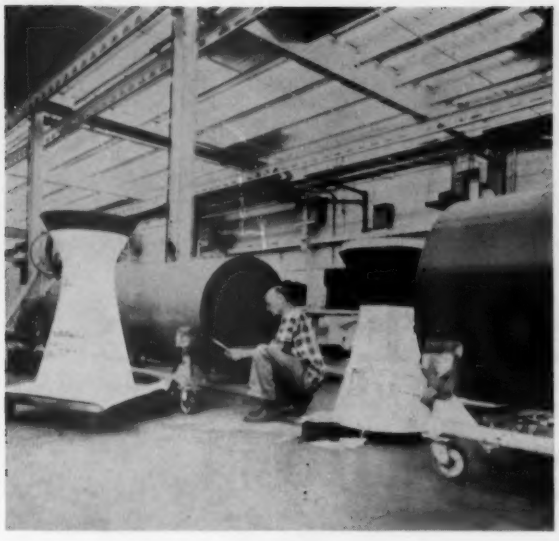
Our team working on Nike Zeus more than fills the bill. The Western Electric Company is our prime system contractor for Zeus, just as it was 15 years ago for Nike Ajax. This company, with the Bell Telephone Laboratories, its in-house development organization, and its hardware fabrication and manufacturing facilities, has more than proved its ability in the missile business.

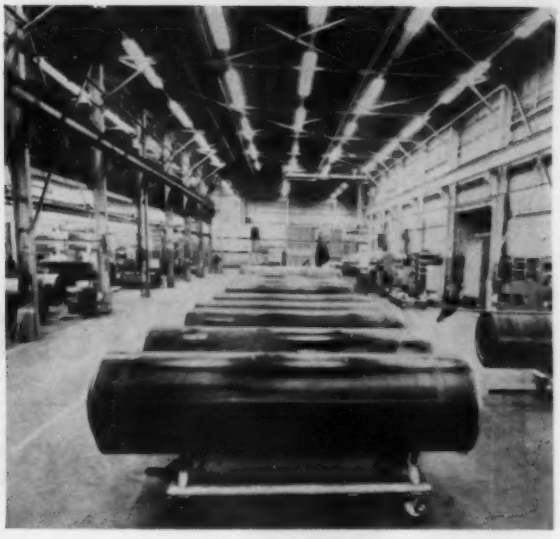
It successfully fielded Nike Ajax and Nike Hercules. It has attained a position of overwhelming prominence in the design and development of radar and capabilities in advanced data processing and handling techniques. Western Electric has had the foresight to recognize and recommend subcontractors for those portions of missile system development that could be more successfully accomplished by other industries.

A good case in point is selection of Douglas Aircraft to provide the missiles for the Nike Ajax, Hercules and Zeus systems. This basic contractor team has been very carefully expanded to accomplish the complex and diversified tasks required in Nike Zeus development.

As single manager, Western Electric views the subcontractors as a vital network feeding in material and data for the successful implementation of the Zeus system. This feeling has stimulated a mutual dependence and appreciation among the entire team. Resulting teamwork has introduced many improvements in the project.

For example, Bell Telephone Laboratories performs numerous tasks and research connected with the civilian economy. In turn this has di-





mandril pit; warhead components being assembled and tested; final trimmings of completed cases for sustainer motors; and booster and sustainer motor cases awaiting completion. Tolerances must be exact.

rectly assisted Bell in meeting military requirements associated with the complex electronic instruments required for Nike Zeus. There has been an equally beneficial aspect, from the over-all standpoint, of Zeus-related developments that have found application in the civilian economy.

This Army-industry team successfully developed the Nike family of air-defense weapons and had the foresight to provide for a next-step approach in their thinking. Because they did, Zeus got off to a running start. The team built on a firmly established base of technical and management know-how that formed the stepping stone for the logical move forward from proved weapon systems.

How much control?

To control contractor effort, we have our own Army management organization. We who are responsible for the nation's defense and the taxpayer's dollar cannot delegate this responsibility to any civilian agency.

Probably the Army's toughest job in over-all project management is to exert the proper blend of control. There is, of course, no uniform approach that will provide ironclad rules for the desired blend of technical supervision and in-house judgment of the contractor's effort.

The success we attain depends largely upon our ability to establish a sound set of general principles for use in our day-to-day contact with our industrial contributors. This is not something that can be achieved through contract legislation.

The follow-on task of determining the interrelationship and effect of a particular decision or lack of progress on other associated system effort is critical. We continually strive to avoid imbalances in effort that, if not corrected, lead to slippage in the over-all program and waste our funds.

This points out one of the prime conditions to successful system management: the need for localized control of the program. Control must be immediate and local, otherwise the transition from one phase of research and development to the next is bound to be a bumpy one.

The contractor team

Western Electric is our single system manager for the major portion of the industrial side of the Army-industry team. Western Electric, with its large array of industrial subcontractors, is our single point of contact.

The Bell Telephone Laboratories, another element of American Telephone and Telegraph, is responsible for detailed system design and development. Western Electric does the pre-production planning and production of articles that require extensive research and development. It will supervise the detailed technical operation entailed in installing the complex Zeus system at operational sites, if a production go-ahead is authorized.

Since we are working now in the advanced re-

Western Electric manages the industrial team for Nike Zeus

Western Electric is proud of the responsibility assigned to it as leader of the Army's Nike Zeus industrial team of companies which brings together broad and diverse capabilities.

The selection of Western Electric as prime contractor was based on the qualifications and experience the Company has developed as manufacturing and supply unit of the Bell System. Western Electric and its partner, Bell Telephone Laboratories, work side-by-side as a team in providing the Bell System with communications products of the uncommon quality and reliability necessary to the operation of a completely integrated nation-wide communication service.

The reliability standards and the "sense of system" Western Electric employs in its telephone job are directly pertinent to the requirements of Nike Zeus. And it follows that Bell Laboratories accepts major development responsibilities in the Nike Zeus program, along with Western Electric.

In addition to their joint work for the Bell System, both Western Electric and Bell Telephone Laboratories bring major defense-project experience to Nike Zeus, from such missile programs as Nike Ajax, Nike Hercules, Terrier, and Titan. Other prime contracts in which the Bell System has played an important part include: DEW Line, White Alice, SAGE, communications aspects of BMEWS, and underwater sonar system projects. And in America's space exploration program, we are carrying heavy responsibilities in NASA projects: Mercury, Tiros, Echo, etc.

Nike Zeus major industrial contributors headed by Western Electric, prime contractor:

ALLIS-CHALMERS MFG. CO.	Target Track Antenna
ARMSTRONG CORK CO.	Acquisition Radar Dielectric
BURNS AND ROE, INC.	Technical Facilities Design
CONTINENTAL CAN CO., INC.	Target Track Antenna
CONTINENTAL ELECTRONICS MFG. CO.	Acquisition Radar Transmitter
DOUGLAS AIRCRAFT CO., INC.	Missile, Booster, Missile-handling & Test Equipment
DOW CHEMICAL CO.	Acquisition Radar Dielectric
GOODYEAR AIRCRAFT CORP.	Acquisition Radar Antenna
GRAND CENTRAL ROCKET CO.	Sustainer & Jet-head Motors
LEAR, INC.	Stable Platform
NARMCO MFG. CO.	Target Track Antenna
REMINGTON RAND UNIVAC	Computers
SPERRY GYROSCOPE	Target Track Radar Transmitter
STEEL PRODUCTS ENGINEERING	Missile Track Radar Antenna
STROMBERG-CARLSON CO.	Test Equipment
TEXAS INSTRUMENTS, INC.	Tactical Displays
THIOKOL CHEMICAL CORP.	Booster
VICKERS INC.	Target Track Antenna

In addition to these 18 companies, hundreds of other "partners"—many of them small businesses—are taking part in the research and development effort on the Nike Zeus anti-missile missile system.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

Under the dome of Nike Zeus acquisition radar a maze of pipes and valves is involved in the cooling system of this portion of the "thinking" apparatus

search and development phase, however, let's look at Bell to see how Nike Zeus management works within the contractor structure.

Bell ties together the design efforts of all the research and development contributors to Nike Zeus. Western Electric, on the other hand, ties together the production effort for the articles used. Much research and development is being done by Bell in-house, and much is subcontracted to recognized leaders in particular fields. The subcontractors work within the over-all guide lines set down by Bell and Western Electric.

Continental Can Company, for instance, is a Bell subcontractor for the target track radar to be employed in the Nike Zeus system. Bell specifies the characteristics, the size of the antenna and the precision of the mount, so that it will meet the characteristics demanded by the Army. Continental Can then exerts its effort to insure that its product will conform to Bell's stated design.

Thus all subcontractors are controlled, so that their products fit into the over-all design scheme for the total Zeus system.

It seems simple on paper. It works well in operation. However, keep in mind that this contractor-subcontractor-supplier relationship extends from the Army to Western Electric at the top, through Bell into 41 states. It involves more than 2,000 businesses and industrial firms.

Just as important as our industrial team from the over-all standpoint of program objectives are the contributions of other government agencies, and the coordination maintained with them. This again is the responsibility of the Army system manager and his technical supervisors. Some specific examples might be helpful toward understanding this.

The military side

Coordination with the Department of the Air Force is vital, for example, to obtain the ICBMs we will require as targets for our full system demonstration. On the workaday level, airlift to move various system components to far-flung test sites is required periodically.

The Department of the Navy enters the picture to provide Pacific Missile Range test facilities for the Nike Zeus missile firings at Port Mugu, California, and our system test complex being readied on Kwajalein Island.

We coordinate within the Army Ordnance Corps with the Ordnance Special Weapons Ammunition Command for arming devices for the missile; with the Atomic Energy Commission for the Nike Zeus missile's nuclear warhead; and with the Army Corps of Engineers and certain naval districts for test-site construction.

Scheduling makes it go

You can readily see that in a program as complex as Nike Zeus—indeed in any program—it is not enough to bring together all these elements and say, in effect, "Go to it, boys." There have to be plans, and detailed schedules for each portion of the program.

Working closely throughout our Army-industry team, we have established schedules for all our program functions. In a program like this, every person must know where he is going and when he is expected to get there.

What's more important, once the schedule is set, it must be adhered to. It's a simple matter to chart progress once schedules are fixed and just as simple to spot potential trouble spots. We look for yellow lights when we read these charts. We want to nip potential trouble spots quickly before they become red lights that would have far-reaching effects.

Everything in the Zeus program has been put on these management control charts. They are essential tools that enable us to keep on top of the situation.

Once a year we sit down with our prime contractor and representatives of supporting government agencies. We know our program objectives and how much money we will have for the forthcoming 12 months. It then becomes a matter of seeing how large a tent can be cut from the cloth available.

Once the plan has been projected as to how the major funds will be provided, we monitor it constantly to see that no one deviates from the path leading to our goal.

Once every two months our monitors at the ordnance district and on-site hold a formal review with the contractors. We confer to see how the money is being spent and to compare their achievements with expenditures.

Other management tools are monthly progress reports and technical coordination meetings. Once each quarter we meet with top-level project managers and key military and contractor representatives. The Army's system manager conducts periodic reviews and inspections.

How we keep atop the program

The Nike Zeus development program is being carried on at sites spread halfway around the world. This program of simultaneous and concurrent testing provides maximum feedback and interplay in the development program, and insures that the system is readied in the shortest possible time.

A special task for management is that of keeping pace with what goes on at widespread sites. It must follow target track radar tests at Ascension Island in the South Atlantic; radar progress by Bell at Whippany, New Jersey; missile firings and system component testing at White Sands Missile Range and Point Mugu; and system installation work at Kwajalein Island. The Army and the contractors have representatives at all these sites.

The Army Rocket and Guided Missile Agency has field representatives at all these installations, as well as at Western Electric and at Bell; at the Atlantic Missile Range Headquarters at Patrick Air Force Base, Florida; at the Douglas Aircraft Company, Santa Monica, California; and at two Air Force key installations in California: Headquarters, Air Force Ballistic Missile Division at Inglewood, and Vandenberg Air Force Base.

In addition, the Army Ordnance Missile Command has a representative on the staff of Commander, Pacific Missile Range, and Commander, Atlantic Missile Range.

All these men are experts. They provide a constant flow to ARGMA headquarters of information which is used for management decisions. Through them, we can keep an eye on Zeus developments no matter where they occur.

Importance of communications

Rapid communication will be vital in the operation of the Nike Zeus antimissile missile system. Accurate data must be passed from the radars to the computers and to the firing batteries with split-second timing. Although speed of transmission is not such a critical factor in managing the Zeus system, good communications are just as important. There is no substitute for personal conversations.

To achieve this, we have set up a special Nike Zeus information network. This secure teletype net permits instant direct and informal exchange of information, much of it classified, between major elements of Zeus management. We can talk station-to-station, or ring in everyone for a full-scale conference to hammer out a particularly knotty problem.

The result is that to keep the program moving at speed, we can make a decision today, on the spot.

Effect of deferred production

That the Nike Zeus development program has moved with speed and in accord with a schedule set almost five years ago is an adequate testimonial to the competence of all participants.

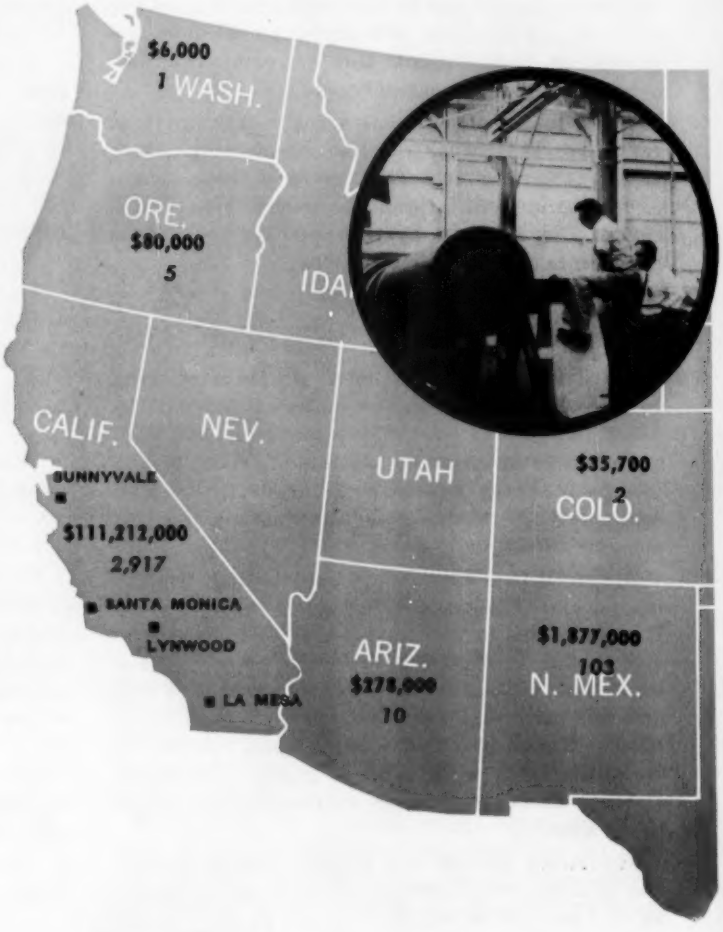
The Nike Zeus system has reached the advanced development stage. The hardware required to demonstrate system capability in actual intercept tests against ICBMs—indeed all the hardware required for the research and development program—has either been fabricated already or soon will be.

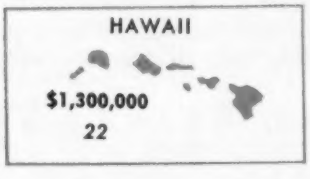
The Army has looked at many approaches to ballistic missile defense. In our opinion Nike Zeus is the best means available within the capabilities of current technology to counter the threat of hostile ICBMs during the critical period we face.

Dome of Nike Zeus acquisition radar is recorded on film by a cameraman at White Sands. Acquisition radar scans space at millions of cubic miles per second

TO EXPEDITE A DEFENSE ATTACK, $410 MILLION IS

The adjoining map shows the amount of money being spent and the number of persons employed in Nike Zeus research and development in 37 states. Not shown is the very small amount of work being done in Nevada, South Carolina and the District of Columbia. All of this work is being performed under the direction of the prime contractor, Western Electric. It is of interest to know that $27,501,000 of the total is under contract in "surplus labor" areas of 35 states. Below we show the plant sites and kind of work being performed by the major contractors and subcontractors.





MAJOR CONTRACTOR

NORTH CAROLINA

BURLINGTON, GREENSBORO & WINSTON-SALEM —Western Electric Co. *Prime contractor*

MAJOR SUBCONTRACTORS

CALIFORNIA

LA MESA—Narmco Mfg. Co. *Target track antenna*

LYNWOOD—Western Gear Corp. *Gear reduction unit*

SANTA MONICA—Douglas Aircraft Co. *Missile, booster, missile-handling and test equipment*

SUNNYVALE—Westinghouse Electric Co. *Hydrodynamic bearing*

ILLINOIS

CHICAGO—Continental Can Co. *Tracking antenna mounts*

MASSACHUSETTS

BEVERLY—Bomac Laboratories, Inc. *High power duplexer*

BOSTON—Minneapolis-Honeywell Regulator Co. *Accelerometers*

CAMBRIDGE—Arthur D. Little. *Refrigeration system*

EVERETT—Avco-Everett Research Laboratory Division of Avco Corp. *Optical discrimination*

MICHIGAN

DETROIT—Vickers Division of Sperry Rand. *Target track antenna*

GRAND RAPIDS—Lear, Inc. *Stable platform*

MIDLAND—Dow Chemical Co. *Acquisition radar dielectric*

MUSKEGON—Kaydon Engineering Corp. *Bearing assemblies*

MINNESOTA

ST. PAUL—Remington Rand Univac. *Computers*

AGAINST ENEMY MISSILE BEING SPENT IN 37 STATES

NEW JERSEY

WHIPPANY—Bell Telephone Laboratories. *System design*

TRENTON—Thiokol Chemical Corp. *Booster*

NEW YORK

NEW YORK CITY—Burns and Roe, Inc. *Facility design*

ROCHESTER—Stromberg-Carlson Co. *Test equipment*

GREAT NECK—Wheeler Laboratories, Inc. *RF plumbing*

—Sperry Gyroscope Surface Armament Div. *Target track radar transmitter*

WOODSIDE—F.X.R., Inc. *Rotary joints*

OHIO

AKRON—Goodyear Aircraft Corp. *Acquisition radar antenna*

SPRINGFIELD—Steel Products Engineering Co. *Missile track radar antenna*

PENNSYLVANIA

ALLENTOWN—Air Products, Inc. *Refrigerator for maser*

LANCASTER—Armstrong Cork Co. *Acquisition radar dielectric*

PHILADELPHIA—Waterman Products Co. *Oscilloscopes*

—Messinger Bearing, Inc. *Radial bearing*

—I.T.E. Circuit Breaker Co. *Rotary joints*

POTTSTOWN—Doehler-Jarvis Division, National Lead Co. *Wave guides*

TEXAS

DALLAS—Continental Electronics Co. *Acquisition radar transmitter*

—Texas Instruments. *Tactical displays*

WISCONSIN

MILWAUKEE—Allis-Chalmers Corp. *Target tracking antenna*

NIKE ZEUS

PRO AND CON

Brig. Gen. D. C. LEWIS

The doubting Thomases have been in full hue and cry against Zeus, but performance is the pay off

I DOUBT that in the history of U. S. Army weapons development any system has generated the same degree of controversy as has Nike Zeus. Proponents and opponents of the system voice their views with emotion and honest conviction. Why this controversy? Since the human element is involved, an absolute definition of "why" is probably impossible. To some, perhaps the magnitude of the problem of shooting down an ICBM warhead traveling at velocities in the range of 15,000 miles an hour is beyond practical solution.

Perhaps the answers are more basic: a complacency toward nuclear attack as a result of excluding from our minds the awesome possibility of such an event, an it-can't-happen-here rationalization. Those economically inclined may be stirred by visions of tremendous costs; the soldier by a preference for some other apparently more direct and simple strategy.

Although the basic human reasons for controversy are not adaptable to an axiomatic analysis, the various arguments postulated by opponents of Zeus may be subjected to such an approach. Our discussion will examine these arguments.

Arguments against Zeus

Despite the fact that Zeus is the only antimissile missile system in the hardware stage for the foreseeable future, arguments against the system continue, but are lessening. They fall into three broad general and overlapping classifications: the technical, the economic, and the strategic.

The technical argument

Many of the early arguments against Zeus were born of the first of these categories, the technical. Some of the skeptical considered the ballistic missile the ultimate weapon, and held the corollary view that defense against it was impossible. Why, the destruction of a missile by another missile carried the same odds as hitting a needle with another needle in a dark alley at midnight! It was like the much-quoted impossible task of hitting a bullet with another bullet. Where would the art of warfare be today if similar arguments had been accepted as final with the introduction of gunpowder—or, to use a more recent example, the military aircraft!

Today, this earlier technical argument has for the most part disappeared. Knowledgeable scientists and soldiers agree that Zeus can intercept the simple ICBM re-entry vehicles. Simple, indeed—traveling at a speed of about four nautical miles per second and offering extremely small reflecting surfaces to the eyes of our radars! Attaining this degree of acceptance is in itself no minor accomplishment for the Zeus program.

Today the areas of honest differences of technical opinion are associated more with sophisticated

postulations in the general field of countermeasures, the associated physics of the ballistic missile's trajectory particularly at the time of re-entry of the warhead into the atmosphere, and the weight of the attack. An example of such a difference of opinion concerns the decoy. This device accompanies the re-entering warhead. Its mission is to confuse the Zeus radars and cause the Zeus fire unit to expend its detonation on objects other than the real target.

Improvements during the past year

The advancing state of development of Nike Zeus is settling many of the technical arguments. The Army feels that the forthcoming tests in the Pacific against real ICBMs will settle all other major arguments, including that involving decoy discrimination. To further improve its capabilities in these controversial fields, during the past year a number of significant improvements have been incorporated into the system. The Zeus approach to and solution of the problem of defense against ballistic missiles have been based upon a logical, orderly advance in capabilities that utilize techniques and components which have been tested and proved. The concept of an "open-ended" building block is used to permit the ready incorporation of improvements in the Nike Zeus system as rapidly as the advancing state of the art permits.

As evidence to support this growth potential approach I submit the improvements incorporated into the Zeus missile and radars during the past year. Perhaps the most attention-attracting advances have been in counter-countermeasures, such as decoy discrimination. During the past year, the Zeus discrimination radar, which provides the basic tool for eliminating decoys and other confusion devices, has been considerably improved. Determination of additional techniques for discrimination is proceeding most satisfactorily. Of course, the interests of national security preclude discussion of details of our progress.

In leaving our discussion of the technical arguments, I remind you that the bulk of these Zeus components we have mentioned are in the hardware stage. That they are operating today is evidenced by other articles in this issue. This is no paper concept.

Inside view of local acquisition radar receiver antenna suggests tall ladder to top of circus tent

The strategic argument

Now let us highlight some facets of the second controversial category, the strategic. This field is of particular concern and interest to all soldiers. Many strategies have been proposed for today's nuclear era. Obviously, an examination of all such strategies in connection with a requirement for Nike Zeus is beyond the scope of our discussion. However, it is well worth our while to consider one such strategy frequently discussed by opponents of Zeus.

The general viewpoint which holds that our entire defense should be predicated upon deterrence that relies upon our retaliatory striking force alone, is based on the obvious fallacy that there is no provision for active defense in the event of failure of deterrence. Certainly an invulnerable nuclear striking force is a necessity, and is the backbone of deterrence. However, such a force does not assure survival in the event of the failure of deterrence; nor does it protect against the many uncertainties of the continuing nuclear age. Included in these uncertainties are the possibilities of an accidental launching of missiles against our country, and the deliberate initiation of a nuclear war between major powers by the launching of a few missiles at one or both of these powers by an ambitious third nation.

Unpredictable Soviet leadership

As it pertains to the initiation of a planned general nuclear war, the value of a defensive system in the role of complicating Soviet strategy becomes increasingly important. If rational leaders remain in control of the Soviet Union (assuming current leaders are rational), they can calculate their win by statistical methods. Since their calculations involve the employment of un-

proved systems—just once—they must rely on "victory by statistics," a risky policy at best. The deployment of an effective defense against missiles would significantly weaken the confidence which could be placed in this statistical win.

Perhaps a more likely attack would result from the emergence of an irrational leader in the Kremlin. Against such a leader, the threat and effect of our retaliatory force is lost; in such an instance deterrence as a strategy does not exist, since this deterrence is a state of mind. In such circumstances only a defensive system can insure our country's survival and our ability to prosecute war to a sucessful conclusion. Deployment of a defense against missiles would do much to insure the survival of our basic warmaking potential and of our infantry and armored striking forces.

Defense of the populace by means of shelters alone also is not realistic when "city targeting" is considered. In this connection, shelters are desirable as a supplement to defense against ballistic missiles, but they are not to be considered vital for this type of defense only; they are equally required to supplement the bomber defenses of today and the Minuteman capabilities of tomorrow.

From these considerations it appears that ample evidence exists to refute the strategic arguments as to the necessity for Nike Zeus.

Skilled missile installation electrician records data on master control panel of Zeus power plant

The economic argument

In regard to the last category in the argument, the economic or cost-effectiveness area, considerable misinformation has been disseminated. Production costs required to support the Nike Zeus deployment recommended by the responsible military leaders total much less than we have spent in the past for defense against the air-supported threat alone.

Many cost effectiveness studies have shown Nike Zeus in an unfavorable light. Generally, these studies compute Zeus costs under saturation attack and sophisticated threat conditions, and then compare these prices against the offensive weapon costs.

Under the unlikely conditions of unlimited enemy stockpiles of weapons and the ability to concentrate them on significant targets simultaneously, the ineffectiveness of any defense becomes an *a priori* conclusion. Under the Zeus concept, the firepower for any individual defense can be tailored to the degree compatible with the priority of the target. If we assume a realistic enemy stockpile and rate of fire, and if the cumulative, rather than individual, protection is considered, the Zeus target capability is adequate to effect a significant over-all reduction in casualties and damage. No defense is impenetrable, but if the price per target is sufficiently high, the number of targets that can be successfully attacked is reduced greatly.

Instead of comparing the ratio of offensive-weapon cost to defensive-weapon cost, consider the lives or families which might be saved. Who can assess the value of human life? An easier comparison is Zeus cost against the material loss in even a single city like Philadelphia, Cleveland, Seattle, or Washington.

The degree of damage which our country could absorb and still survive as a nation is in itself a subject of great controversy. Regardless of the specific extent of destruction which may be used in this argument, it is obvious that an active defense with the effectiveness expected of Zeus would so significantly enhance our chances that no enemy could inflict this required minimum degree of damage. An ultimate question could well be asked proponents of the economic argument: "What could be more expensive than losing the war?"

With that, the defense rests. I trust I have established a case for Nike Zeus, although the need for presenting such a case appears unnecessary. The Army has reason to be proud of its accomplishments in the Nike Zeus field, and has every confidence in the successful conclusion of its development.

NIKE ZEUS

KWAJALEIN TEST BASE

The first step in clearing Kwajalein for a Nike Zeus test base was taken 16 years ago when the 7th Infantry Division wiped out the Japanese in what became a classic battle for an island . . . now the Army engineers carry on

A TINY piece of real estate in the Pacific, more than 4,000 miles from the U. S. mainland, today is the scene of feverish activity by the Army's Corps of Engineers as they rush to complete construction of one of the most complex and difficult missile facilities ever built: the Nike Zeus antimissile missile test base on Kwajalein Island.

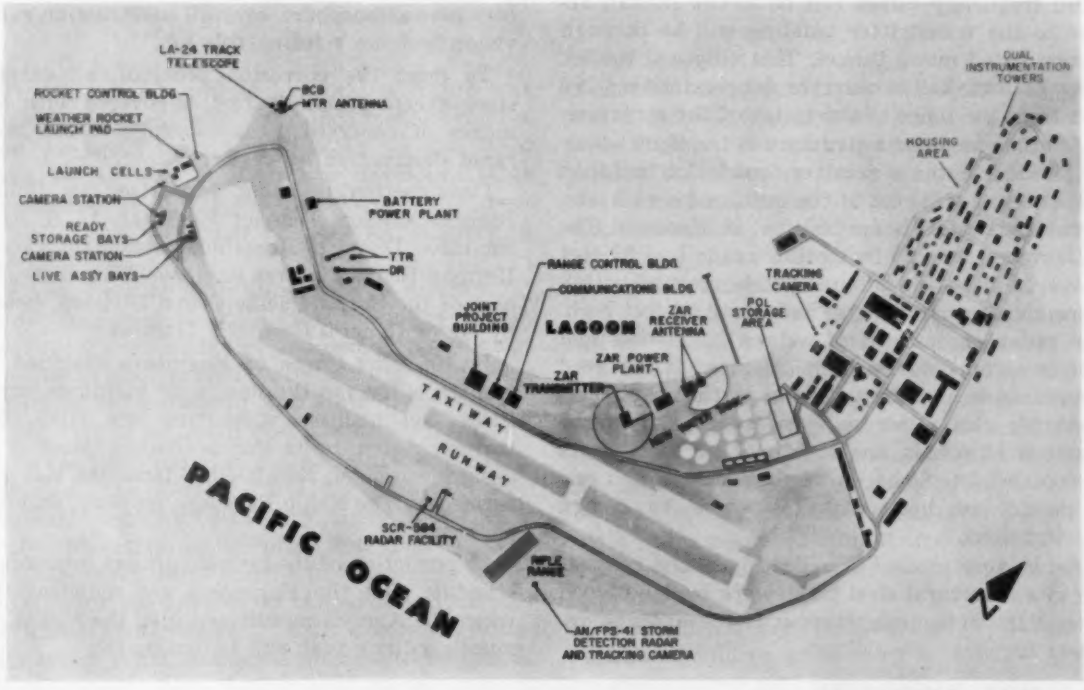
The island's high humidity and the effects of corrosion, the length of supply and transportation lines and the requirements for speed and new highs in construction precision combine to present the Corps with a genuine challenge to its engineering know-how.

Work on Kwajalein began in August 1959. It is part of the program for developing the Pacific Missile Range which includes construction of missile and rocket facilities at Point Mugu, California, Roi-Namur, and Johnston Island.

Facilities to be built on Kwajalein include elements of four missile launchers, tracking radar structures, power plants, a technical operations building, and several other support structures. Before construction on the island is completed in the late fall of 1961, the Engineers expect to spend some $75 million.

The 602-acre island is shaped somewhat like a horseshoe and is up to six-tenths of a mile wide and about 2.5 miles long. It has a marine tropical climate which is fairly constant most of the year. Rainfall averages 102 inches a year and, by a strange coincidence, the average of both the percentage of humidity and the degree of temperature is a steady 82. Typhoons are rare and a

Nike Zeus facilities, air strip and housing crowd the horse-shoe shaped Kwajalein atoll



northeast trade wind cools the island except during August, September and October.

One major structure finished in July is the joint technical operations building. This two-story building, costing $1.5 million, is of structural steel with concrete block and is fully air-conditioned throughout its 200 by 220 feet. It will serve as the main office building for technical and scientific personnel and also has several machine shops for on-site modification work.

The launch facilities are under construction in an area of 180 by 205 feet; each of the four launchers requires a steel-and-concrete cell 16 by 20 feet and 60 feet deep. To simulate possible tactical conditions of launcher location, one pair of cells is staggered and another is in line, parallel. The missiles will be loaded into the cells from the top.

Work is also progressing on the Zeus acquisition radar transmitter building. This concrete structure also is fully air-conditioned, and is rectangular, 100 by 140 feet and 40 feet high. The outer surface will be coated with asphalt and then covered with a terne metal (steel coated with a tin-and-lead alloy). The terne metal cover is necessary to prevent radio frequency interference with the electronic equipment inside the building.

A steel shielding fence 65 feet high has been erected on a 150-degree arc around the ZAR transmitter building. The remaining portion of the arc will have a fence 6 feet high. Before completion, a metal screen will be mounted on the structural steel frame of the fence to dissipate radio frequency waves generated by the powerful transmitters. Because under certain conditions the radio frequency waves can be lethal, human access to the transmitter building will be through a corrugated metal tunnel. This elliptical tunnel, 8 by 17 feet, has a concrete floor extending 290 feet from the fence to the inside of the structure.

Another important structure is the Zeus acquisition radar antenna receiver foundation building. The antenna will rest in the center of a concrete, circular structure some 100 feet in diameter. The building extends 25 feet below grade and 33 feet above. In place, the antenna will be covered with a dome 100 feet in diameter and about 50 feet high. The radar antenna itself weighs 1,250 tons and stands several stories high. So great is the need for precision in construction here, that the metal liner for the radar antenna shaft had to be plumbed to within one eighth of an inch of its 45-foot height. Some of its foundations had one millimeter of horizontal tolerances as design specifications.

A two-acre ground or reflecting plane, consisting of a structural steel framework bridge topped with aluminum mesh, surrounds the antenna receiver foundation building.

Two power plants are being constructed, both to house precise power generators. Inconstant or fluctuating power cannot be tolerated in the Zeus system.

The acquisition radar power plant building is two stories high and 113 by 180 feet. Eventually, it will be expanded to bring over-all length to 220 feet. In its present state, the power plant building will house nine 1,500-kw generators, each weighing 203,000 pounds, and two more will be added in the future.

The battery power plant is a two-story rectangular structure, 100 by 130 feet. When completed, it will house six 800-kw generators, but there are no current plans for adding more generators later.

One difficulty which faced the construction team very early in the project's development was the necessity to enlarge the island's water supply system. Rain water is conserved in a 52-acre catchment capable of impounding 1.2 million gallons per inch of rainfall. Its total capacity is 5 million gallons. The water is then drawn from the catchment and stored in 15 tanks, each with a capacity of 1 million gallons. The stored water is pumped into a treatment plant and through a distribution system, which includes a 100,000-gallon overhead storage tank.

Even under ideal conditions, it is difficult to construct facilities to house a new missile system's delicate ground support equipment, most of which represents significant technological breakthroughs. When the purely construction problems are compounded by logistics difficulties (Kwajalein is 2,000 miles from Honolulu) and a brutally corrosive atmosphere, over-all construction supervision becomes a formidable job.

To meet the corrosion problem, all exterior steel, except stainless steel, is covered with four inches of concrete. Less coverage would invite rapid destruction by rust.

Construction is being supervised by Colonel John R. Clifton, District Engineer, U. S. Army Engineer District, Honolulu. Lieutenant Colonel Herman Brunke is area engineer. This district is part of the Corps' Pacific Ocean Division, headed by Major General Gerald E. Galloway.

In 1958 the Corps of Engineers assigned the responsibility for the design of buildings, structures and utilities supporting the Nike Zeus weapon system to its Mobile District. Most of the design work for Kwajalein's facilities was performed by The Ralph Parsons Company, architect engineers.

Construction of the over-all project proceeds on schedule, and the Engineers are confident that when the Army's missilemen give the signal, the missile killer's nest will be ready.

Aircraft that are low, slow and heavy-laden with fire power

Lt. Col. WALTER A. GUNTHARP

NATO's lightweight strike reconnaissance aircraft by Fiat of Italy
Shown is the G91R, single-seat version with cameras in nose

WHERE'S TAC AIR?

The increasing probability that a future war will be fought with restrained means requires that we profit from what lessons we can learn from World War II. That war developed some sound and enduring lessons. Among the most forceful was the value of close air support of ground forces.

Early German war films showed aircraft, in close coordination with tank-infantry teams, pouring fire on befuddled and demoralized troops who never had a chance to recover until their positions were overrun and their transport lay smoldering along roads and in motor parks.

As the war ground to a close, conditions totally reversed. The sound of friendly aircraft was a constant overtone to the cacophony of battle. In Italy, the retreating Germans and their supporting equipment were caught on the plains of the Po between the anvil of the Alps and the hammer of Allied fighter aircraft. Like a helpless boxer, the entire force staggered under the onslaught, fell, and was counted out well before the main event ended farther to the north.

In France, the same picture unfolded in the Rhône Valley where the air-inflicted destruction of German equipment and rolling stock reached such awesome proportions that the problem of wreckage removal impeded the progress of pursuing U.S. troops.

In postwar reports and critiques, German commanders published agonized accounts of frustrated operations and loss of control due to Allied tactical air support of ground troops. German armor and transport littered the roads. Movement of troops and equipment was virtually impossible by day and greatly impaired by night. Troops were demoralized, fear-ridden and bone-weary with the omnipresent threat that gave no respite from the continuous searching death from the skies.

Now, in the bare minimum interval since our warborn children have come to fighting age, we

are not only foregoing our advantage; we are ceding it to an enemy who weighs us every day on the balance of war and awaits only that day when the balance is clearly favorable to our destruction. Today our army has no effective close air support.

Korea demonstrated the cost of this loss. Ground support operations performed by the early F-80 jet aircraft and their faster replacements were often so ineffective that many commanders regularly refused the offer of an air strike in connection with infantry attacks. A Marine Corps aviation strike, however, was a vastly different affair. Marine planes came in low, slow and heavy-laden. They were geared to the job, responsive to ground control, and packed a heaven-sent haymaker in the combined power of ground-air attack. The Army unit commander who once got a Marine air strike gained a new appreciation of the influence of close air support on ground operations.

TAF planes do not meet tactical needs

The difference lies in equipment and training. Emphasis in Air Force research, development, and production in aircraft has resulted in planes which fly increasingly higher and faster. In the battle for air superiority, which is a primary mission of the Tactical Air Force, these planes, in partnership with surface-to-air missiles, are essential. These TAF planes do not meet the need for aircraft fitted to the ground support role, and this need is even further neglected with every advance in thrust, speed, and altitude.

Among the European forces of NATO, where memories are longer and more painful, this fact is well recognized. Against this recognition, the G-91 lightweight strike fighter was selected by NATO for development by Fiat of Italy with U.S. financial support under the Mutual Weapons Development Program. This rugged little plane, which combines features designed by England and France, is blood brother to the soldier. It has no exotic capabilities in speed and altitude. It needs no expensive complex of 10,000-foot runways, no elaborate operational bases. It is simple, efficient, and unashamedly a battlefield support aircraft.

The Federal Republic of Germany, since its admission into NATO, has taken a long-headed view of its needs in terms of combat aircraft. The result is a simple arsenal of two models. One, the F-104, has been chosen to gain air superiority. The other, the G-91, is for on-the-deck operations in direct support of the army. The logic of such planning, and the balance attained thereby, are distilled from hard experience and a cold-blooded assessment of the threat.

Those who argue that such defense philosophy is archaic overlook the fact that the Soviet Union is committed to ground battle with a ready force of more than 100 combat divisions. These divisions are supported by more than 10,000 tactical aircraft that are specifically designated as ground support planes, or are employable in such a role.

Nuclear strategy's hard trigger

Similarly, those who lean toward the grisly philosophy of the strategic megaton as the preservative of world freedom seemingly discount a fact which could destroy us: The arsenal of nuclear strategy has a hard trigger, one with much slack. This slack affords the forces of aggression a vast latitude of action short of nuclear war. The truth of this has received far too little of our sober consideration, for its significance is such that the next war can be lost in the arena of conventional conflict before the first round of nuclear retaliation is fired.

For example, do we settle a border clash with a nuclear weapon? Apparently we do not. Would we defend our interests in Asia or the Middle East with strategic missiles, or would we set things right with a SAC-delivered nuclear mission? Again, if we draw on past actions, the answer is No. What event would exert enough pressure so that we squeeze off a strategic weapon?

The fault in massive deterrence is that it offers no practical remedy against the nibbling aggression which has characterized Communist expansion in the Far East, and erodes constantly at our politico-economic interests in Africa, the Middle East, Europe, and Latin America. If we do not stop such nibbling, we can fall under political, economic, and military domination through the slow effect of cumulative losses. Each acre of ground that gives way to Communist aggression carries with it a subtle shift in international relations. Who is to say where lies the acre which will shift the international balance of the major powers? Soon after that line is crossed we will know it by the tumbling tide of political and economic adversity, but the nibble which inflicts the mortal wound will be of the same pattern as its predecessors: too small in itself to pull the trigger of our strategic arsenal. This, not a nuclear holocaust, is the true threat to America, and it is the grimmest and most foreboding threat we have ever faced.

Our military needs are clear

In the face of this threat, our military needs emerge with compelling clarity. Of course we need weapons of massive deterrence. The malevolent ambitions of the Communist philosophy demand that we curb the behavior of its major proponents with a clearly recognized potential for their total destruction. Additionally, however, we need a force not for the obliteration of mankind, but for

the precision-fitted support of our national policies, both in general war and in areas where the probing fingers of Communist aggression seek to push back the boundaries of freedom. The central element of this force is the Army. To be fully effective and adequately responsive to our needs in this age of peril, our Army must be not only adequate in size, highly mobile and flexibly fitted to meet the threat, but it must have effective close air support.

The best assurance we can give our children that they too can flourish in the freedom of their forefathers, is an Army with the versatility and balance that will respond on call to any situation in any conflict short of a strategic nuclear exchange. This is a more precious gift than comfortable living and color television.

The thought outlined here appears to enjoy growing support in the Congress which is acting to supply the Army's needs for modern equipment, and may be thinking in terms of moderate increases in our ground defense establishment. There is no indication that the Congress is disturbed over the Army's lack of close air support, however. It seems incongruous to state, in an age of superbly engineered aircraft, that we have a critical requirement for planes that are far within the state of the art. But we do.

The aircraft we need for close ground support would not be fitted to any other combat role in the modern air picture. We need a relatively slow airplane that is extremely maneuverable and which at very low altitudes can deliver sustained fire support. For such a craft safety as well as effectiveness lies close to the ground, and in its own suppressing effect on the enemy. It must be able to come in on the nap of the earth, strike, and return in the same manner. By flying low, it escapes effective detection by electronic acquisition means, and makes but a fleeting and difficult target for air-defense weapons firing from the ground. If we can add to these capabilities the hitherto unfound virtue of noiselessness, its effectiveness will be even further enhanced.

Short take-off and landing from unprepared fields or undeveloped strips are essential characteristics of the ideal ground support aircraft, for it must be wedded to the soldier it supports.

The ground-support craft we have described are so necessary in ground operations that they could spell the difference between victory and defeat. They would give our Army a degree of effectiveness that might forestall a strategic desperation that could otherwise compel us to nuclear remedy. This consideration is of the greatest possible importance.

We need such aircraft to support battle group attacks and strengthen armored spearheads. We need them to help extricate isolated units on tomorrow's fluid battlefields. The division commander must have them at his fingertips for blowing bridges, smoking, strafing, bombing, napalm attacks and engaging targets of opportunity. They should be controlled by the field army commander through attachment or some similar arrangement, so that their reaction to tactical need is immediate and undisputed.

The form of control we need

This is the airplane we need, and the form of control we need. The ground unit commander who in today's fluid, fast-moving combat is told by theater headquarters he might get three or four supersonic jets the day after tomorrow may just as well forget tactical air support.

In any type of future warfare, we can no more depend on the philosophy of a quick victory than we can accept the prospect of a quick defeat. In the key strategic areas of Europe and the Near East, Soviet and satellite forces are capable of a quick thrust on frontages that defy nuclear frustration. If some incident arose which made war imminent, the Soviet rear would be dispersed into protected nerve centers. Initial supplies would be scattered and pre-positioned. Early objectives would be those calculated to replenish the logistical impetus from captured sources. If we were to undertake nuclear denial we would be confronted with the total destruction of Europe. Still the tide of enemy ground forces could not be stemmed, for men, of all targets, are the most difficult. Infantry is the most mobile of all forms of military force, and it requires the least support, provided—and here is the key point—it is not opposed by infantry.

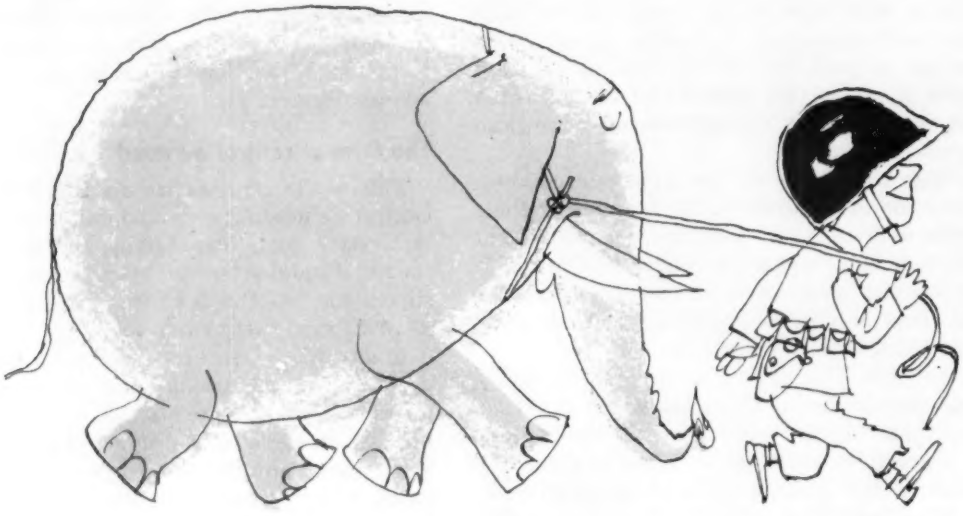
This leads us to NATO, and to NATO on the ground—withdrawing, delaying, trading space for time, but seeking by all means to avoid such compression as will make a composite target of our ground forces and their logistical back-up.

If, confronted by such a situation, we choose to cede the crucial advantage of close air support to a ground force which outnumbers us by more than 100 trained divisions, we are likely to go down to a defeat which no plan or leadership can avert.

If our Army is strong, mobile, and well balanced, and is properly equipped with the means for filling its role, we can halt the eroding edge of limited aggression. With adequate strength at the beginning and with the help of our Allies, we can win the ground phases of a general war. There is a grave provision, however, in the conditions we have set forth: We must have an Army that is properly equipped with the means of fulfilling its role and one that has adequate and effective close air support. Heaven help us if we don't have it and the enemy does!

The resourceful company scrounger can turn up a pink elephant for the company commander in need of one

MSgt. FORREST K. KLEINMAN



TASSO CAN DO

WHENEVER I hear someone offer a hundred-odd reasons in advance why something can't be done, I always think of T/5 Tasso of my old outfit, the 15th Infantry. He wasn't much to look at: a half-pint in a big helmet that was usually adorned with a weird assortment of dead grass, leaves and wild flowers native to whichever region we happened to be passing through. Even in battle denims, somehow Tasso contrived to look like a civilian. But if we had opened his scrawny chest, I swear that where his heart was supposed to be we would have found the regimental coat of arms, including its motto, *Can Do.*

Long before the outfit left the States Tasso was known and feared by company commanders and supply sergeants throughout the regiment. There was an unwritten standing order in the 15th Infantry declaring all supply rooms but his own off limits to Tasso. Not that he ever *stole* anything. Tasso was much too resourceful to resort to anything so base as moonlight requisitioning. He would simply walk into a neighboring unit's supply room and begin to talk. A moment later a once hard-boiled, cynical supply sergeant would wipe tears from his eyes and shell out treasured gun patches, firing pins, tentpoles, or whatever Tasso needed for his company.

Overseas our company garnered even greater benefits from Tasso's unusual talents. Some people think strategy or logistics or tactics won the war, but in the minds of the men of Company D there is no doubt: it was T/5 Tasso!

One hot day in June 1943, Company D was bivouacked in a grove of cork trees in North Africa, about 60 miles from the bombed-out seaport of Bône. The Tunisia campaign had just ended, and already the general order was out: neckties and fresh shaves daily. But no fresh food!

For two weeks the men of Company D had been enjoying that gourmet's delight, the World War II C-ration—chock full of vitamins and home-cooked goodness, prepared especially for our boys overseas in three tempting varieties.

The company commander, a gaunt young ancient with short-cropped blond hair and Custer mustachios, listened to the murmurs of anticipation that rose from hungry throats as each new batch of the famous three flavors was opened, and he scowled. "We're spoiling these men," he said to me, "feeding them nothing but those delicious C-rations day after day. What they need is some dirty old chocolate ice cream."

Long accustomed to the day dreams of company commanders, I merely grunted and swatted futilely at a squadron of African flies that was making a reconnaissance in force of my ears and nostrils.

"Sergeant!" The company commander's voice had that fuzzy edge I had come to know meant the birth of an idea.

"Yes, sir!" I answered. The skipper was grinning for the first time since we had gone into bivouac.

"Send for T/5 Tasso."

I passed the word. In a few minutes the small man in the big helmet ambled up to the company CP. A three-day Van Dyke adorned his chin. His shirt collar was open to the waist, and his helmet was adorned with enough foliage to camouflage the battalion. I shook my head in resignation. He was at once the bane and secret delight of my existence.

"Tasso," said the company commander, "what this company needs is chocolate ice cream for supper tonight."

Tasso's black eyes glinted avidly, but his thin face was expressionless. "Can do, sir," he said. "Just give me a jeep."

"OK, tell the motors sergeant I said to dispatch a jeep to you."

Tasso's hand whipped up to salute, missed the brim of his helmet and tangled with the foliage in his camouflage net. Unabashed, he about-faced and headed in the direction of the tent area.

I looked at the captain and shook my head dubiously. "This time I think you've gone too far, sir. Here we are in the middle of nowhere. The only town is sixty miles away, and its probably bombed all to hell. We've got no canned milk, no ice, no sugar, no money, no nothing!"

"How about the time Tasso produced fresh eggs for the company's breakfast when we were in the Taza desert?" countered the company commander. "How about the time he told the Khaid of Raf Raf I was Eisenhower's nephew and all the Arabs in the village turned over their German rations and Lugers to us? And how about the time at Rabat he built mess tables for the whole company when even an orange box was selling on the black market for ten dollars?"

"He's a wizard, all right," I admitted. "But chocolate ice cream! You might just as well have asked him to bring back a pink elephant!"

Though I tried to keep the word under wraps, it wasn't an hour before very man in the company was saying "ice cream" and licking his chops. By mess call Tasso had not returned and you could cut the tension in Company D with a bayonet.

Five minutes passed while 173 men with mess kits and spoons milled impatiently in the mess area. Cases of the famous three flavors lay unopened in the kitchen truck. All eyes were glued on the road to Bône down which Tasso had departed that morning.

Ten more dry dusty minutes crawled by . . . twenty. Still no sign of Tasso. A man began to beat his mess kit with his spoon. Others picked up the beat.

I looked at the drawn face of the company commander and cleared my throat. "Sir, I think you'd better speak to the men."

The captain rose, avoiding my eyes, and walked out of the clump of cork trees we called a CP. The men quieted as he approached.

"Looks like I sent Tasso on a wild goose chase this time," he said. "Guess we'll just have to eat some more of those delicious C-rations."

A moan went up; then they were silent. With long faces the company began to line up at the mess truck.

Before the first case could be opened, however, someone spied a cloud of dust on the horizon. It loomed larger and larger, until at last we could make out the outlines of a jeep with a familiar shrubbery-bedecked helmet on the little man at the wheel. The jeep pulled into the company area and stopped under a yelling swarm of men.

Tasso emerged. With only a hint of swagger, he ambled up to the company commander and reported: "Mission accomplished, sir!"

When I had finished my third big helping of rich, creamy chocolate ice cream, I could hold my curiosity no longer. Ordinarily I made it a practice never to ask Tasso how he accomplished his miracles—just in case of official repercussions. But this was too much for me. I summoned Tasso to the privacy of a thicket.

He grinned at me expansively. "It was simple, Top. I knew there must be some base section commandos around Bône who were itching to lay their hands on proof that they won the war. So I calls our men together and takes up a collection of German helmets, Iron Crosses, belt buckles and junk like that.

"When I get to Bône, I go to the American QM depot. But they say no dice to canned milk and sugar on account of they are strictly honest johns who wouldn't think of short-stopping the front-line troops. So I have to settle for cigarettes and candy out of their own rations.

"I take these American cigarettes and candy over to the British dump, and trade for scotch out of the Tommies' rations. Then I go back to the QM. When I flash those bottles of scotch at them, suddenly they realize that *we* are front-line troops. So they load me up with canned cow, sugar, chocolate pudding, and salt.

"Now I got to find ice. I figure where there's a hospital there's probably ice, so I talk to the supply sergeant at the evacuation hospital just out of town. He says they get it from a French railhead about twenty miles down the coast. When I get to the ice-house, I yell that I just came from the hospital and I gotta have ice for an emergency case—which is perfectly true in a way.

"All I got to do then is say 'ice cream' to some chowhounds in a truck outfit. Quicker'n a shavetail's salute, they rig up a paddle and top for the marmite cans which they churn with ropes tied to the handles.

"When it's finished, I give each of 'em a dish. I pack the marmite cans with salt and ice in the GI cans, and—"

"Tasso!" It was the company commander's voice.

We moved from behind the thicket and I saw the captain sitting against a cork tree, licking his spoon with a dreamy look on his face. Tasso walked up and reported.

"Tasso," said the captain, pointing to a group of men who were pushing the one-ton trailer up to the kitchen truck, "what this company needs is an elephant."

"Can do, sir," said Tasso, without batting any eye. "Just give me a jeep."

As Tasso about-faced, the captain caught my incredulous look. "Oh, Tasso," he added, "make it a pink one."

DOCTRINE

The cement that binds

Gen. GEORGE H. DECKER

This article is condensed from an address the Chief of Staff delivered at the Command and General Staff College, Fort Leavenworth, on 16 December 1960.

We soldiers share a deeply rooted faith in the indispensability and in the permanency of the land combat function. We realize that the means to perform this function will change in the future as they have in the past. But we have an unshakable faith that as long as there is land, and people on the land, the land combat function itself will remain a decisive element in any future conflict.

A fundamental and distinctive function, such as land combat, requires and inspires its own distinctive doctrine. I'd like to speak about doctrine which goes hand in hand with professionalism.

Doctrine is indispensable to an army—or to any military organization, for that matter. This is true because doctrine provides a military organization with a common philosophy, a common language, a common purpose, and a unity of effort. Doctrine influences, to a major degree, strategic thinking as well as the development of weapons, organization, training, and tactics. Doctrine is the cement that binds a military organization into an effective fighting unit.

I am speaking now of doctrine in its broadest sense. This doctrine includes not only the tactical employment of forces, but also the fundamental principles or tenets of Army thinking. These concern such matters as the strategic conditions under which Army forces should be employed, the relation of these forces to those of other Services, the operational environments of the field forces, and the basic principles which govern the operations of dual-capable Army forces which can fight in either nuclear or non-nuclear war. In this sense, we might consider doctrine as an Army creed which spells out the way we view our purpose in life and our relation to others. I'd like to list some of the specific beliefs of this creed.

First among our beliefs is a principle stated in General Orders 100, of the War Department, dated 24 April 1863:

> Modern wars are not internecine war, in which the killing of the enemy is the object. The destruction of the enemy, in modern war, and indeed, modern war itself, are means to obtain that object of the belligerent which lies beyond the war.

The philosophy expressed in that statement permeates all our strategic thinking.

Going on from this principle, the Army believes that the strategic problem of the United States as leader of the Free World coalition in these turbulent times is immensely complex. We believe that there is no neat nor parochial solution to this problem. We cannot have an exclusively "maritime" or "aerospace" or "land mass" approach to strategy. The Army believes that the strategic solution must be a flexible, pragmatic combination of all these three, considered in context with political, economic, and other nonmilitary factors that further complicate the formulation of strategy.

To carry this theme further, the Army believes that the land, sea, and air components of national military power are interdependent elements to be

applied under unified command and direction toward attainment of the objectives of the United States. Each element is indispensable; all are complementary; together, they form an integrated team.

The Army believes that, although land, sea, and air forces are complementary, land forces possess a distinctive capability. This capability is to defeat enemy forces in land combat and gain control of the land and its people.

Our doctrine takes into account the fact that the land, unlike the relatively homogeneous sea and air, is a medium of infinite variety. Its nature is complicated by variations in terrain, by vegetation, by man-made structures. Within this complex medium, individual soldiers must live, move, communicate, and fight as teams. We have learned that the problems of land combat, therefore, are not susceptible to formulae, simple dogmas, slogans—or even rules of thumb.

Hence, our philosophy and doctrine must be pragmatic and flexible. Army planning by its nature must be detailed, and provide for various contingencies. We must exhibit a flexibility, a resiliency, and an adaptiveness to cope with the shifting tactics of an enemy always quick to probe any chink in our armor. Similarly, Army tactics and organization cannot be evaluated by mathematical methods alone. Always they must be evaluated in light of the wide experience which the Army has gained in the art of warfare in the land environment.

We believe that Army forces play a vital part in any form of war—from the outset of a general thermonuclear war to its conclusion—in the wide range of war short of this ultimate all-out form—and in the lower levels of violence such as the counter-insurgency and guerrilla actions which are becoming increasingly important.

We cannot be sure where Army forces may be employed—or under what conditions. However, a look at the trouble spots around the world, from Berlin to Laos, from Korea to deepest Africa, is enough for us to be sure that forces to operate in the land environment must be ready at a moment's notice for any kind of war, any place, and at any time.

I want to emphasize that a static doctrine in today's dynamic world environment could result in military—and national—suicide. This is especially true during a period such as the present when our strategic nuclear capabilities and those of the enemy appear to be approaching a state of parity. Such a situation has tended to produce the equivalent of a strategic nuclear disarmament. In this world environment, dual-capable land forces—an essential element needed to fight in wars below the general nuclear war level—assume an ever-increasing importance. Constant re-assessment of the doctrine governing the employment of these forces on a battlefield which could shift from non-nuclear to nuclear at a moment's notice is an obvious need and presents a continuing challenge. This re-assessment requires intense and coordinated effort by all Army agencies concerned with doctrine—our schools, our forces in the field, and others—if we are to continue to provide the doctrinal guidance which the Army must have.

In closing, let me reaffirm the basic message of this talk—an abiding conviction and faith in the indispensability and permanence of the land combat function.

In so doing, I would like to quote from an address made by S. L. A. Marshall in 1946. You all know General Marshall's deep faith in the soldier and in his function. In this address he described an action on Utah Beach, on D-day 1944, in which one of the key objectives was a coastal battery. He stated:

> A battalion was supposed to take this place. Instead a sergeant named Summers from the 502d Regiment was sent against it with 12 men; there were none others available. They were a miscellaneous crew—none from his own outfit. And so when at the first building, they were met with enemy fire, they quit him. He went on alone, kicked open the door of the barracks and tommy-gunned 12 of the enemy while they were working at the fire slots. Then a captain from the 82d Airborne Division joined him and was shot dead before he had taken 10 steps. Summers rushed the second house, kicked open the door and shot the people dead. A lieutenant joined him and had hardly made a move before he was riddled with bullets. Summers went on down the row alone—six stone barracks in all; at the last one he got 23 men. He had accounted for somewhere around 80 by that time. And so the position fell . . .

And then General Marshall adds ironically ". . . fell to the might of America's mechanical superiority and great industrial power."

In the final analysis, this belief in man and his land combat function is a matter of faith. We don't just reason out these things. We are not simply convinced of them. We *know* them.

...TO COMMAND ONLY

Washington's birthday reminds us that
"When we assumed the soldier, we did not lay aside the citizen"

Col. WALTER E. LORENCE

Once in a generation, perhaps less often, there comes an opportunity for a great man to play his part wisely and fearlessly in some critical period of his nation's struggle for existence. If I were to name the achievement for which George Washington deserves most from mankind, I should award the palm, not to Washington the soldier, but to the Washington of the crucial days following the American Revolution. Emblazoned on the scroll of history is this crucial period, this zero hour of the Republic. Had there been no Washington in those troublous times, our nation might be a different one today.

The war having resulted in a triumph for American independence, Washington felt that his services were no longer required. Like Cincinnatus of old, he felt that he could return to the labor and repose of his fields. But for him retirement was only a dream. So far he had only made possible the birth of the infant nation.

Of his constitutional ideas we know enough, certainly, to picture what would have happened had he stood with Lincoln at Gettysburg. In love of our union they were equal; one spent a whole life in creating what the other met death to preserve. Fear of disunion haunted Washington after the American Revolution, as the fact of secession nerved Lincoln to his valiant endeavor.

In early life Washington suffered the consequences of scattered authority on the Indian frontier. From this time on the idea of a strong Union dominated his mind. While commanding the Revolutionary Army, he endeavored to eliminate state rivalry among his soldiers, and so imbued the army with the idea of an American Union that its favorite toast was "a hoop to the barrel"; that is, the hoop which would make the 13 states or staves one solid barrel.

Equally firm and deep rooted was his conviction that the government of the Union must be republican. At the outbreak of stupid license and sedition, many able minds

TO SERVE...

reverted to the idea of a monarchy as the only means of reaping the fruits of the long struggle. Washington was offered a crown. His response was instant and indignant. Later conditions grew worse and many men were convinced that the only way to bring order out of chaos was to use the Army to impose a new constitution. Their ideas were those of Caesar—to make virtue a short cut to the common welfare. They should have known Washington better! On assuming command had he not said: "When we assumed the soldier, we did not lay aside the citizen."

The climax came when Washington stood before his officers at Newburgh. His address was as resolute as the faces before him. When he had finished he took from his pocket a letter. The writing was less legible than his own bold hand, and he was obliged to put on a pair of spectacles recently made for him. As he adjusted the bows, he remarked simply and intimately, "Gentlemen, you will permit me to put on my spectacles, for I have not only grown gray, but almost blind, in the service of my country." There was not an eye that did not itself grow dim, and when Washington withdrew, the meeting resolved its unshaken confidence in the justice of Congress.

But the country seemed destined for catastrophe. Civil war broils between states, civil breaches of peace, and the repudiation of its just debts harassed the new nation. Washington knew little of the web and woof of politics, but he knew the needs of his country. He was truly what we never cease to acclaim him, the Father of His Country—too clear-eyed to ignore the faults of his people, too wise to be glibly indulgent, yet devoted to the people unto death. Thus, he was far more active than appeared to the world at large. Quietly and unobtrusively, he endeavored ceaselessly to win leading men to his ideas of national union. His dream of a waterway across the mountains and his organization of the Potomac Company blazed the path for the Federal Convention, by solving the problem of joint action between a group of states. It was only natural that he should have been chosen to preside over the body which framed the Constitution and began a new era for the Republic.

To summarize the greatness of Washington as exemplified during this most perilous period of our Republic, his conduct and labors were ever constructive; although an aristocrat and a soldier, he was a gentleman of the New World, with democratic ideas, who bore neither title nor decoration, who disclaimed supreme powers, and who wished to command only to serve; and finally, because as one of the spiritual leaders who presided over the birth of our nation, he has been an inspiration and a model to free peoples throughout the world.

"A sudden attack can cause very great harm, but it will not be a decisive factor in the outcome of war"

Col. JOHN O. WEAVER

A SOVIET GENERAL LOOKS AT FUTURE WAR

DURING the past few years military planners of the Free World have been arguing the nature of future war. The debate has centered mainly around the relative merits and likelihood of "general" as opposed to "limited" war. The concepts of these divergent points of view have been thoroughly discussed in this and other service journals, so there is no point in repeating them. It is interesting to note, however, that while proponents of each school of thought have been both eloquent and articulate, they never have been able to compose their differences and agree on a single, definite concept as to what the battlefield of tomorrow will be like.

Meanwhile, being so completely engrossed in the trends of this debate, we have not been giving enough attention to what has been going on in the councils of the Soviet General Staff regarding the same matter. Has general-versus-limited war been a bone of contention there, too? Has our potential enemy also concerned himself with determining whether to concentrate on nuclear or on conventional forces in order to achieve his ultimate objectives?

In a recent issue of *Krasnaya Zvyezda (Red Star),* official newspaper of the Soviet Army, Lieutenant General S. Krasilnikov sets forth Soviet views on "The Character of Modern War." Krasilnikov is a senior member of the Soviet General Staff and is recognized as its authority on military theory and strategy. His comments, especially when published in *Red Star,* may be regarded as official in every sense of the word.

No pushbutton affair

According to Krasilnikov, future war will be totally unlike anything we have known; so different, in fact, that it almost defies understanding. Surprisingly enough, it will be characterized by the clash of massive ground armies "many-million strong" and by the unrestricted use "from the very first moment" of nuclear missiles launched primarily at the enemy's "deep rear." Krasilnikov is quick to point out, though, that this does not mean future war will be a pushbutton affair, or that it can be concluded in a matter of hours or even days. On the contrary, Soviet military theory foresees a long, protracted conflict of attrition. Victory will go not to the side which seeks a quick and easy conquest by launching a

mammoth ICBM attack; rather, the victor will have been astute enough to organize his forces in keeping with the times and will have instilled in his troops a "high sense of conscientious duty."

The character of any war and its peculiarities, says Krasilnikov, is determined by the "social-economic conditions" of the period during which it is fought. This is nothing new in Communist ideology. It simply means that warfare and its conduct are determined not only by the state of technology and industrial output which supports the effort, but also by the mental conditioning and political awareness or indoctrination of those who fight. In the latter area, he notes that recent years have introduced some new and truly significant developments.

Until very recently international affairs have been dominated by the capitalist nations of the West. This power has been so great and so extensive that it was virtually unopposed as the major political system of our times. However, Communist doctrine holds that since World War II, a shift in the balance has occurred. During that conflict, fascism was smashed in Europe and crass militarism was abolished in the Orient. At the same time, many new nations in both Europe and Asia transferred their support to the so-called "socialist camp." Today, these nations, together with the Soviet Union and its satellites, exert a new and decisive influence in international politics. Morever, according to the Communist point of view, this new bloc of power is welded into a solid front by common bonds of class consciousness and a joint ideology that necessitates a new basis for Soviet military planning.

An "agonizing reappraisal"

Proceeding from this new base, General Krasilnikov enunciates a startling and significant tenet of future Soviet policy. This is a sweeping commitment of military support that, so far as can be determined, has never before been stated officially by any responsible Communist leader. Krasilnikov is plain-spoken: "If war occurs the countries of the socialist camp, united by common class and social-economic interests and a joint ideology, will not only deal a smashing counterblow to the imperialist aggressors, but will achieve the latter's complete annihilation. Moreover, *an attack of imperialist aggressors on any of the socialist countries will be regarded as an attack on the USSR and the entire camp of socialism.*" [Italics supplied.]

The first part of this quotation may be discounted as sheer ideological bombast. But the italicized portion warrants further study. For years Communist ideology has held that any nation not actively *for* communism is necessarily and automatically *against* it. No variation from this fundamental precept was accepted. Then a subtle change began to occur when highly industrialized capitalist nations did not collapse from "internal contradictions" as Marx predicted they would. Moreover, when, despite strenuous efforts by international communism to engineer revolutions and hasten the predicted collapse, these nations not only remained going concerns but actually grew stronger, the Kremlin was forced into an "agonizing reappraisal."

It was unthinkable that Marx and Lenin could have been wrong; so the answer had to be found elsewhere. It was not long in coming. From Moscow flowed the new teaching that capitalist countries kept alive not because they were inherently strong, but because their economies were propped up by cheap raw materials and labor squeezed out of the underdeveloped areas they had subjugated. Colonialism, according to the Communists, was a prop that permitted capitalism to delay its inevitable downfall.

Change in the old principle

This thought became father to a change in the old principle. The collapse of capitalism and the dominance of communism could be hastened by weakening the alleged support the West got from its colonies—by a sort of flank attack, as it were. If people of the underdeveloped areas of the world could be weaned away from exclusive dependence on the West, if their raw materials and resources could be diverted even to a small extent, then the Communist cause would be advanced. Under this concept the old idea that all who are not for us are against us, lost validity. The new strategy indicated that the peoples of colonial lands, even though not necessarily for communism, were in fact its allies in the battle against the West. Accordingly, the battle cry was changed to: All those who are not against us are, at least potentially, for us.

This is what gives such frightening import to General Krasilnikov's pronouncement that "an attack on any socialist country will be regarded as an attack on the USSR and the entire socialist camp." Communism's new operating slogan has strong overtones of classifying the underdeveloped areas of the world as members of communism's self-appointed "camp." And propaganda emanating from Moscow during the past few months, particularly that unilaterally pledging missile support to Fidel Castro and political support to the new African nations, supports the reality of such enrollment, at least in Communist minds. What this signifies for the future is anybody's guess.

Let us now go back to Soviet visions as to the nature of future war. The second element of General Krasilnikov's dissertation flatly rules out any

possibility or hope that the next war can be a local or limited affair. The all-for-one-and-one-for-all unity of the world-wide "socialist camp" makes that unthinkable. "In the light of this the 'theories' of some bourgeois military ideologists on so-called local, limited wars against the socialist countries look particularly foolish." How can a conflict be localized when the "socialist camp" is now universal in extent and is pledged to act as one in a future war?

Weapons limitation a dream

Moreover, when it comes to limiting war as to the type of weapons employed, the *Red Star* article derides this is a "dream" of the West. On the contrary: "If a new war comes it will be conducted primarily with new means of combat. These means have colossal destructive power, unlimited range, great speed and great accuracy. It follows from this that from the very first moment this war would become a nuclear-rocket war."

Having thus ruled out the possibility of any kind of small or brush-fire war fought along conventional lines, General Krasilnikov immediately cautions his readers against assuming the Soviet General Staff is thinking of an impersonal, Buck Rogers type of scientific conflict. "A nuclear-rocket war," he says, "must not be thought of as a sort of 'push-button' war which will be conducted without mass armies. . . . There is no doubt that in a new war mass and many-million strong armies will participate. They will need great reserves of command personnel and tremendous contingents of rank and file troops."

As for the tactics these gigantic armies will use, Krasilnikov is rather vague. He notes only that "methods of combat, its dynamics, and the degree of tension will change essentially." At the same time, some indication of what future land combat will be like is implicit in his description of the impact that mechanization, physics and electronics already have exerted on the make-up of the Soviet Army. These things "have changed the image of the USSR armed forces which today are vastly different than they were in World War II. At that time the land forces and, above all, their rifle units and groups of units, the artillerymen and tankmen, carried the main brunt of the war on their shoulders. Now the rocket troops have become the main arms of our armed forces in general. This by no means signifies a curtailment in our land forces. Soviet military science holds the view that victory can be achieved only as a result of the correct utilization of the rocket weapons in coordination with all the other means of combat."

Meanwhile, according to the Soviet concept, as these massive armies clash, fundamental changes will occur in conditions in the rear areas: "In the last war the strategic efforts of the opposing sides were basically concentrated on crushing the enemy's armed forces and the deep rear was affected only to a certain extent." This, he says, was because at that time no nation had a weapon of sufficient power or range to have a decisive effect by striking the rear. But today, military decisions can be achieved by striking at the deep rear of an enemy with missiles of unlimited range that carry as much destructive power in one warhead as that of all the bombs dropped on Germany during 1940-45. "Thus," he concludes, "in a nuclear-rocket war, from the very first day, the deep rear will become a battlefield of fierce combat with all the terrible consequences resulting therefrom."

Surprise will not affect outcome

Such a capability, General Krasilnikov continues, not only elevates defense against aircraft and rockets to new heights of importance, but also sharply poses the question of surprise and suddenness of initial attack. In connection with the latter, and after intense study and despite all the talk about achieving total and immediate victory through the surprise launching of hundreds of ICBMs at the enemy's homeland, the Soviet General Staff has this to say: "Soviet military science affirms the following: Regardless of the fact that a sudden attack can cause very great harm, it still cannot become a decisive factor in the course and outcome of the war."

Such naive hopes for quick and easy victory in a war of the future, says *Red Star,* are patently loose thinking that springs from an apparent resurgence of Hitler's old theories of Blitzkrieg. According to current Soviet doctrine: "The time war will take can not be planned in advance. If it is a matter of conducting a war against great countries which comprise thousands of kilometers and which are well prepared militarily, a swift blitzkrieg cannot be relied upon."

In Soviet doctrine, future war is neither "general" nor "limited." Rather, it is a strange and horrifying combination of both. While retaining some elements of each, in the synthesis to modern war these elements are raised to new qualitative levels and actually create something entirely new and different. For this reason, diehard proponents of exclusively general or limited war will bitterly attack the Soviet concept—though each may find in it much grist for his own single-minded mill. The significant fact in General Krasilnikov's concept, however, is that the USSR has adopted it as its own, and in its image has been busily reorganizing and re-equipping its armed forces. If war ever does come again, Soviet intentions regarding strategy and tactics should surprise no one—least of all our own military planners.

Had the Mexican gunners in Castle San Juan de Ulloa hit the target they had bracketed that bright March day in 1847, some illustrious Civil War names might have been lost to history

Lt. Col. WILLIAM GARDNER BELL

National Archives

Old Fuss and Feathers Petrita's *skipper*

Petrita's Command Reconnaissance

ON the morning of 6 March 1847, the little steamer *Petrita* edged out of a forest of masts and spars flourishing in the United States naval anchorage at Anton Lizardo on Mexico's east coast and turned her bow toward the port of Vera Cruz lying a dozen miles to northward. The diminutive vessel carried a precious cargo: all the officers of rank and position, Army and Navy, comprising the leaders of an imminent American invasion of a hostile shore. The assault force lay poised on board transports in the Lizardo roadstead under the protective guns of warships of Commodore David Conner's Home Squadron. Its leaders were off on a reconnaissance of the hostile coastline to select the landing site.

Among those on board the *Petrita* this day were a number of junior officers who would rise to fame in a later war. In the pending clash—God and the fortunes of war willing—they would acquire the seasoning and demonstrate the qualities that would carry them to the heights in that later conflict. Then, tragically, not all would be on the same side. Now, however, they stood against a common enemy, and before the day was out he would come close to spiking their careers short of the events that brought them fame.

By the first week of March 1847 American arms had triumphed in a long series of actions, and a large area of Mexican territory had come under our control. In the northern theater the battles of Palo Alto, Resaca de la Palma, Monterrey, and Buena Vista had been fought and won by General Zachary Taylor's forces, but hopes for a quick victory gradually faded as the Mexicans showed no inclination to negotiate. As early as the summer of 1846 the realization struck home that a few victories in the northern states would not do the trick. And yet the enemy's vitals lay far to the south, and the tremendous supply and communications difficulties involved in an overland campaign ruled out serious consideration of a thrust by Taylor from the Rio Grande.

Top U. S. officials, appraising the unstable political atmosphere in the nation to the south, were convinced that the capture of her capital would end the war. As early as July, proposals were advanced for a seaborne expedition down the east coast to land near Vera Cruz, and a shorter strike inland to Mexico City. Through the summer and fall the design took on form and substance—although not without considerable stress and strain.

For if there was political unrest in the opposite camp, not all was serene at the home seat of government. Democrat President James K. Polk was, in fact, in a bind. On the one hand, he wanted to win the war. On the other, while winning the war he might well lose himself and his party the next election, for he was faced with prosecuting the military campaigns through Whig generals. Taylor's victories already had placed him fairly in contention as an opposition candidate for the Presidency. And with the Vera Cruz operation in the offing, only one soldier—also a Whig—loomed with the stature and professional competence to command what promised to be the largest joint amphibious operation ever undertaken by U.S. forces.

AFTER weeks of maneuverings and vacillations during which he searched desperately but fruitlessly for an eligible Democrat, the President bowed to the inevitable. He appointed, as head of the expedition against the City of the True Cross, General in Chief Winfield Scott, a soldier who had demonstrated his fighting abilities and leadership qualities in campaigns dating back to the War of 1812.

Scott plunged immediately into the monumental job of organizing a task force for employment in a distant theater of war. By the end of November he set sail from New York City, gathering up the loose ends, ironing out problems, arranging for men and materials, and hooking on the elements in successive stops at New Orleans, Brazos Island, Camargo, Brazos again, Tampico, and Lobos Island.

Finally, on Friday, 5 March, the great armada closed in at Anton Lizardo. With more than 10,000 troops at his back, the expedition commander was ready to launch a walloping left hook to the enemy's flank. Or, to put it another way, while Taylor held the enemy by the nose, Scott would kick him in the seat of the pants.

The Old Fuss and Feathers nickname pinned to Scott was perhaps the logical product of his keenness for discipline, an excusable egotism, his high rank, the pomp and circumstance of the military scene, and the public's fondness for exaggeration. But while Scott may fairly have been classed as something of a character, he was also, on the record, an outstanding soldier and general. On arriving at the scene of action he lost no time in making his move. The very next morning he joined Commodore Conner on board the *Petrita* to make a reconnaissance of the hostile shoreline.

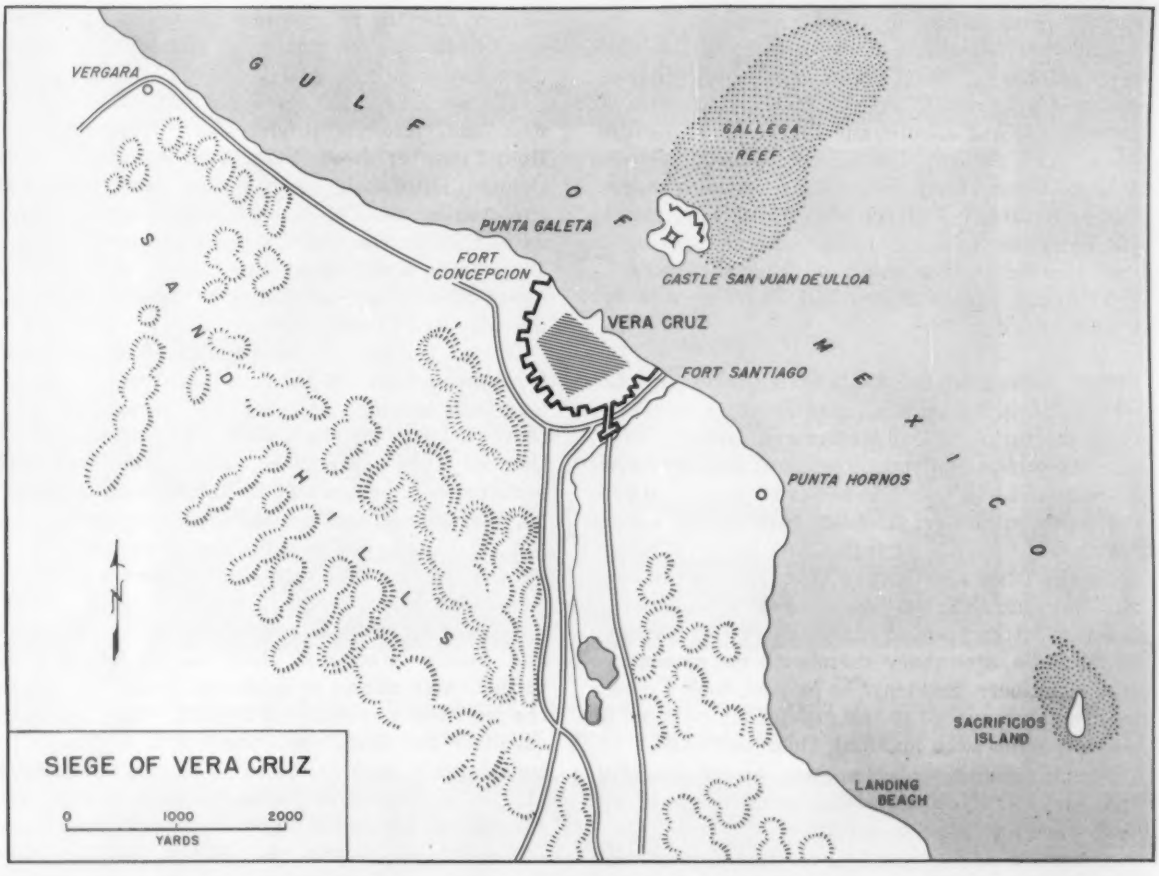
Opposing the U.S. force were some 5,000 Mexican troops. About 3,800 of these garrisoned the walled and bastioned city of Vera Cruz, while 1,200 manned the frowning ramparts of Castle San Juan de Ulloa, a formidable citadel a thousand yards or so off the waterfront.

DURING the moment of decision-making a senior commander is a lonely figure. Inescapably he is beset by a myriad of problems which arise out of conflicting considerations as to the best course of action, and often out of the divergent recommendations of subordinates. So it was with Scott at Vera Cruz. The yellow fever season was almost at hand, and he was anxious to seize his objective and move out of the coastal region to the healthier climate of the inland plateau. It was probable as well that Mexico's President and Generalissimo, Santa Ana, moving south after his "victory" over Taylor at Buena Vista a fortnight before, would soon come up with significant reinforcements.

These were strong arguments in favor of an immediate assault. Indeed, many of the younger officers, eager for a chance to close with the enemy and earn distinction on the field, were urging this move. But Scott felt that a frontal attack against the imposing enemy defenses would only result in prohibitive losses.

At the other end of the scale lay a far safer method: to lay siege to the city and castle and starve the enemy into submission. But the *vomito* disease and Santa Ana ruled out such a time-consuming plan of action, to say nothing of a political opposition and—far to the rear—public clamoring for results.

Scott finally selected a middle course that combined siege and bombardment. Even before his arrival at Vera Cruz he had decided to land his



force south of the city, throw a ring of troops and batteries around its landward side where the defenses were weaker, and reduce first the city and then Ulloa.

IN a preliminary reconnaissance made some weeks before at Scott's behest, Conner had chosen the beach of Collado as the most suitable point for the debarkation. This was between two and three miles down the coast and opposite the little island of Sacrificios. The island and its reef afforded protection for the invasion fleet against the northers prevalent at this time of year, and the Mexican guns lacked the reach to take the area under fire. Now the army commander was to have his look at the assault zone.

The *Petrita* steamed up from Anton Lizardo along a coast that appeared to be uninhabited. The only sign of life was an occasional Mexican dragoon or two riding along the shore, and at a distance of several miles they did not appear to be very warlike. Scott was not one to underestimate an enemy, however, any more than he was one to overlook a detail of planning and preparation, and he had brought along on this reconnaissance his first team. It was a distinguished group that sat down to lunch through the hospitality of Lieutenant Samuel Lockwood, the *Petrita's* skipper.

Picture, if you will, the imposing figure of Winfield Scott, General in Chief of the U.S. Army, only three days shy of three decades as a general officer, veteran of the War of 1812, the Black Hawk War, the Seminole War, and now leader of his country's expedition against a new enemy's seat of power. Visualize him conversing with Commodore Conner, commander of the Home Squadron, blockader of the Mexican coast, naval commander of the Vera Cruz expedition, and considered the best-dressed man in the Navy.

There, flanking the top commanders, you see the generals commanding the major elements of the invasion force: the temperamental William Jenkins Worth; David E. Twiggs, the "Bengal Tiger;" and Irish-born Robert Patterson. Next are the brigadiers: the unprincipled Gideon J. Pillow, the aristocratic John A. Quitman, the hard-working James Shields, and the popular Persifor Smith of brevet rank.

Mixing with the troop commanders are the members of Scott's "Little Cabinet," including Colonel Joseph G. Totten, Lieutenant Colonel Ethan Allen Hitchcock, and Captain Henry Lee

Scott; respectively, the staff's chief engineer, inspector general, and adjutant general.

And there down the line are some of the engineer officers of Scott's and the other generals' staffs: Captains Robert E. Lee and Joseph E. Johnston, First Lieutenant Pierre G. T. Beauregard, and Second Lieutenant George Gordon Meade. What resounding names in later years! But on Saturday, 6 March 1847, these were merely the identities of some junior officers basking in the reflected glory of stars on other shoulders.

Truly the United States had all its eggs in one basket this day.

THE survey of the Collado beach during the cruise up the coast elicited Scott's approval of it as the target for the American landing force, and the *Petrita* moved on to pass around Sacrificios Island and swing in toward the port, where the party might get a closer look at the enemy positions.

As the little ship turned the point of the long reef on which Castle San Juan de Ulloa stands, Colonel Totten focused his glass on the masonry battlements, appraising them with the expert eye of the engineer. Suddenly he paused, took a closer look, and announced to the group that he thought the Mexicans were manning their batteries.

Persifor Smith took the glass, peered intently, and spoke: "They are using their sponges; we shall have a shot presently."

A flash, a puff of smoke over the parapet, and the deep boom of a Paixhan gun, and the high command of the Vera Cruz expedition, floating like sitting ducks only a mile and a half off the enemy fortress, were at the mercy of the Mexican gunners.

The first round was a shell, and it fell short. To Captain Robert E. Lee this was the first hostile shot of his career.

Commodore Conner, who as senior Navy officer on board was regulating the movements of the ship, ordered the engine stopped. The purpose, so we are told by George A. McCall, who was on board, was to let the Mexicans "have a fair trial of their skill in gunnery." Were the Americans so contemptuous of the Mexicans' skill? Or did Conner, seeing the short reach of the first round, believe his ship to be out of range?

E. Parker Scammon, one of Scott's aides and, like McCall, later to rise to general, recalled some years after that "the boats and tenders of the naval squadron had repeatedly made the passage unmolested by the guns of San Juan, [and] the naval commander supposed it beyond their reach." It is not impossible that both Scott and Conner wanted to make a display of courage, and certainly the engineers wanted as close a look as possible at the defenses whose reduction would call into play their best talents. Yet why did Conner hold the *Petrita* idle on such a dangerous spot while the Mexicans continued to exercise their batteries?

The second round came hard on the heels of the first and, like its predecessor, dropped short. Round number three "burst high in the air," says Colonel Hitchcock, "the pieces scattering and threatening us. The fourth passed directly over us and fell in the water a hundred yards beyond. We were in a ridiculous position . . . with no adequate object, without means of defense, with all our officers of rank on board."

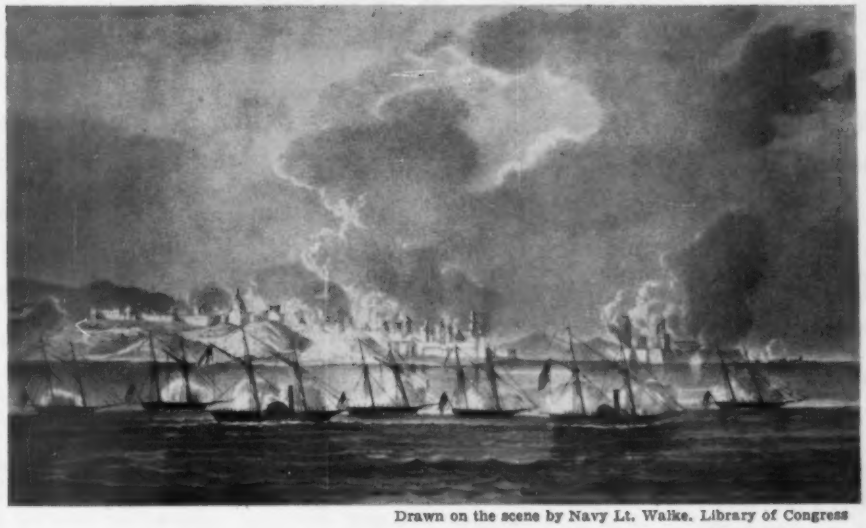
Indeed, the little *Petrita* had no effective means for fighting back. Of Mexican registry, this American-built steamer, captured by Commodore Matthew C. Perry in the Tabasco expedition (23-24 October 1846), displaced barely 200 tons and mounted only one small gun. In the circumstances, her best course, and indeed the only sensible move for her passengers, was to run away and live to fight again another day, under more auspicious conditions.

With four rounds the Mexican artillerymen had neatly bracketed their target. Now they turned their efforts to splitting the difference. In the next few rounds, says McCall, "they began to calculate the charge and the length of fuse with considerable accuracy, and to scatter fragments of . . . shell around the boat." One or two just cleared the top of the *Petrita's* wheelhouse.

Somewhere around the eighth shell the full implications of impending disaster seem to have penetrated the minds of Conner and Scott. Amid a shower of fragments, Conner, according to McCall, remarked to the General in Chief "in his gentle manner" that he thought the party might now proceed. Scott assented and the *Petrita* was put under way and moved off followed by three or four parting rounds.

At least one of the junior engineer officers had some definite reservations about the whole affair. "This operation," declared George Gordon Meade, "I considered very foolish; for, having on board all the general officers of the army, one shot, hitting the vessel and disabling it, would have left us a floating target to the enemy and might have been the means of breaking up the expedition." The risk was to Scammon "an act of gross rashness, because it was not necessary for attaining the end proposed by the reconnaissance."

APPARENTLY the weight of discretion this day lay with the junior officers. Certainly someone of higher rank than Scott and Conner was watching over the *Petrita,* although the enemy probably handled his part rather badly. "Ten shells and one solid shot were thrown at [the Americans] before they were out of range," wrote



Drawn on the scene by Navy Lt. Walke. Library of Congress

The Falcon, Reefer, Vixen, Petrel, Bonita *and* Spitfire, *gunboats of Commodore Conner's Home Squadron, open fire on Vera Cruz and the Castle San Juan de Ulloa.*

Captain E. Kirby Smith to his wife from his own ship back in the fleet anchorage. "The stupidity of the enemy alone saved them," went on this fine officer, soon to lose his life at Molino del Rey. "The enemy should have used their entire water battery and thrown solid shot alone, opening on the boat when nearest, and they must have sunk it."

But the Mexicans neither sank nor struck the *Petrita,* and she slipped on out of range and sailed back to Anton Lizardo, there to disperse her valuable cargo of rank to their proper positions throughout the force.

D-day in 1847 came on 9 March, Scott's thirtieth anniversary as a general. His troops hit the beach against no opposition and moved forward to string the line of investment along the sand hills back of Vera Cruz. On the 26th the city and castle surrendered and Scott was ready to launch the drive inland to the Halls of Montezuma. Along the way Lee, Johnston, Beauregard, and Meade were to distinguish themselves, foreshadowing the even greater distinction they would earn as senior commanders on one side or the other during the War of the Rebellion.

WE are beginning a great centennial commemoration that takes note of that bitter and bloody civil war in which our junior engineer officers of the Mexican War rose to the heights. We are about to step out on a march of anniversaries from 1861 to 1865 commemorating anything and everything from Sumter to Appomattox.

Along the way the careers of some of America's great soldiers will be resurrected: the Union's Grant, Sherman, Meade, Sheridan, and Thomas, for example; the Confederacy's Lee, Jackson, Stuart, Beauregard, and Johnston, to mention only a few. What they did and what they were, will inspire all of us—Yank and Rebel partisan alike—once again. For these were great men.

The paths to military greatness are rarely smooth and never certain; the course of history and of individual destiny for the soldier often hangs by a thread. So it was on that day in the spring of 1847 off the port of Vera Cruz, when the guns of Castle San Juan de Ulloa came close to wiping out the command of an expedition and a quartette of America's future Great Captains and great men.

ARMY cerebrations

THE ONE-ONE-TWO CRAZE. *What's a basic soldier trained in heavy weapons supposed to know?*

Lt. RICHARD N. GEREAU

"I'm a One-One-Two," the soldier told me. So, inflated visions in mind, I answered: good, I'd make him an SS-10 crewman.

"What's an SS-10, sir?"

I tried another tack, saying that on second thought, since evidently he wasn't familiar with the SS-10, he'd probably do better as an M56 crewman.

"M56? What's that, sir?"

Now it was my turn to try a question: "Have you a military driver's license?" No, he didn't.

Here before me was a soldier rated with an MOS of 112. What should such an MOS mean to me, his commander? It should mean a soldier wearing it is qualified in basic heavy weapons: 81mm mortar, 4.2-inch mortar, M56 90mm self-propelled gun, SS-10 and SS-11 guided missiles systems, 106mm recoilless rifle, ammunition handler for all these weapons, and capable of driving their assorted prime movers and ammunition resupply vehicles.

Finally I elicited from this soldier the information that his training had been limited to firing the M1 rifle, the automatic rifle, and the caliber .30 light machine gun. His only familiarity with any other weapon came through seeing it from afar or passing it on the reservation.

What was wrong with this soldier?

Nothing. He was merely another victim of the 112 craze. Our first-line-of-defense-combat-ready units are heavily loaded with his type. The only remedy is for us to acknowledge the condition and take the valuable time we need to train these soldiers in the fundamentals of the particular weapon system to which they have been assigned. We can pray that they have sufficient aptitude to learn, and then we can weld them into the team—if there is any team left.

If time runs out and the proverbial balloon goes up, our emergency measures are still available, of course. We can simply load one, fire, and hope for the best. But isn't the best way to avoid any disease to practice preventive medicine? What can we do in the case of this soldier? I have a plan.

First, we can determine the need for trained personnel according to TOE positions in units that are currently mobilized, considering existing and forthcoming vacancies, and train new men with these needs in mind. We must not forget to make allowances for normal attrition.

In addition, we can develop a new "tag" with a more precise definition. MOS 112 is too all-encompassing. If a new three-digit MOS is not feasible, let's develop a new suffix digit. We might use something like this scheme:

112.00 basic heavy weapons MOS
112.10 trained in basic heavy weapons
112.110 trained in SS-10
112.111 trained in SS-11
112.106 trained in 106mm recoilless rifle
112.142 trained in 4.2-inch mortar
112.156 trained in M56 90mm assault gun
112.181 trained in 81mm mortar

And so on.

Whatever must be done, let's do it now and not wait until after the shooting starts. It's late now; it might be too late then.

WHAT GOOD IS THE RBI? *In a ball game it is important, but as a corrective measure, like Casey it strikes out*

MAJ. THOMAS W. BOWEN

Time was when the Reply by Indorsement was reserved for misdeeds so serious that only a written explanation served for senior commanders to judge the infraction. Today some seniors require an RBI for even the most casual delinquency by the lowliest recruit. Not only is it used to correct such sins as uncut grass, lights burning during daylight, and late attendance reports. It has almost become the standard for replying to minor deficiencies observed by an IG during his annual inspection. "Lint in the barrels of two rifles" evokes the cryptic reply: "Lint was removed from the barrels of these two rifles." By such indiscriminate use some commanders have converted the RBI into an exercise for the competent clerk instead of an effective manner of pointing out a major defect and requiring that the subordinate state how he will correct the deficiency.

Such paper leadership and paper discipline defeat not only the purpose and effectiveness of the RBI; they affect the morale of the people in the chain of

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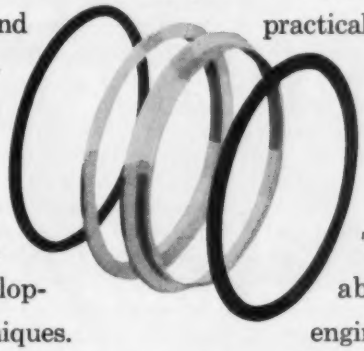

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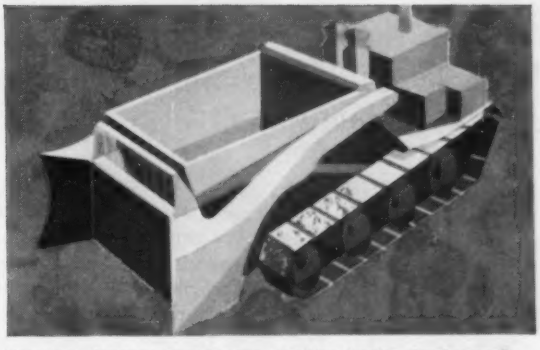

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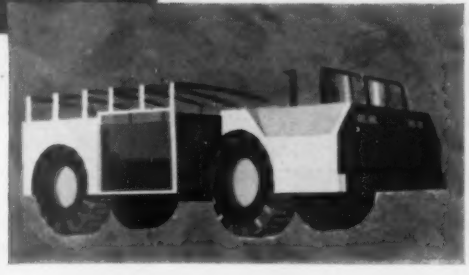
8-ton GOER (under development)



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command who must participate in the seemingly endless flow of indorsements. On top of all this it is not an efficient method of getting a job done.

At 0647 the division duty officer sees that the 100-watt bulb over the entrance to Captain Bravo's orderly room is still burning. He notes the fact in his little black book. From this almost innocuous delinquency springs an effort that will touch every level of administration in the division. Perhaps the case of *Captain Bravo's Burning Light* v. *U. S. Army* makes this administrative journey:

The division duty officer telephones the office of the division provost marshal, whose clerk records the message, and the provost sergeant is instructed to prepare an RBI for the Chief of Staff's signature. After it is typed, checked and dispatched, the Chief's clerk logs it in, hands it to the Chief's assistant who checks and places it in the next load of business to go in. The Chief of Staff reads and signs the RBI. His clerk dispatches it to the division message center by runner. Here the clerk drops the RBI in Combat Command A's pick-up box. CCA's message center clerk carries it to his sergeant major, who turns it over to the executive officer. And so on and on.

After reading the RBI Captain Bravo curses that 8-ball CQ and asks himself the rhetorical question: "Don't those people at Division have more to do than send out these damned things?" Having let off his usual blast, he hands the paper to his clerk. "Fix it up like we did last month. You remember: 'Written instructions have been posted; the first sergeant will include in his briefing'—" In short, nothing that hadn't been done prior to the RBI. Now the important document can start back up the chain.

Even if you discount the paper, the wear and tear on typewriters and nerves, carbon paper, and shoe leather, this method of correction is penny-wise-pound-foolish. To deliver the RBI to Bravo may require as many as 20 persons, not counting multiple handlings. It takes each clerk in the chain maybe five minutes to handle the document and each supervisor or distributor another minute, and each signature requires 30 seconds. I figure the cost of the RBI's round trip at $2.27 in pay alone. If electricity in this area costs 1.2 cents a kilowatt hour, Captain Bravo's light would have to burn 1,890 hours to equal the wage-cost of that RBI.

I am not attempting to convince anyone, let alone the whole Army, that we can save money by burning lights when they are not needed. I do say that trivial use of the RBI is not a sound way to exercise command.

There is a proper use for the RBI, but not as a corrector of minor infractions. Its improper use as such destroys its effectiveness, wastes manpower and money, and adds one more nitpicking chore to the work of the whole chain of command. Minor delinquencies can be dealt with during regular visits by commanders, or duty officers can correct on the spot by admonishing those responsible. Let's keep our administrative lines open for important business. There is enough of it.

'BREVIATED BLUES. *Sagging socks and sartorially sanctimonious seniors synthesize a sorrowful song*

LT. COL. H. F. WALTERHOUSE

Now that the geese have honked their way southward, and the voice of the turtle dove is silent in the land, it seems inappropriate to discuss abbreviated uniforms. But according to authoritative sources, spring is just around the corner, and so is the abbreviated uniform.

I am not sure how our abbreviated uniform originated. Most likely the idea was borrowed from the British by Quartermaster planners with humanitarian instincts. I am inclined to think they copied too well.

There is little room (no pun intended) for quarrel with the shorts. When the temperature soars, their roomy, ventilated construction is a boon in southerly latitudes, and in those climes their built-in creases remain sharp far longer than those in quick-wilt khakis. The shirt generates somewhat less enthusiasm, largely because its bobbed, square tail, ideal for aerated outside wear, was introduced to a tuck-in, shining-buckle society. Worn tucked, the garment has a tendency to creep and balloon.

My real complaints, however, are reserved for the socks and the restrictive fiat with respect to wearing the abbreviated uniform.

That strain of sadism which motivated designers of knee-length socks probably can be identified, but let's leave that to the head-shrinkers and concentrate on the problem. Not only are the ribbed stretchies clingingly warm, but even on a well-turned pair of shanks they sag distressingly, and our walkless society is not developing the calf muscles it once did. The only solution, then, is in garters—uncomfortable, constrictive devices that are certain to contribute toward circulatory ailments in the nether regions.

Why can't we have neat, cool, and comfortable short socks? "Protection," rationalizing proponents will argue.

Protection against what? Abbreviated uniforms were not intended for field wear. On drill fields and parade grounds the only protection these Elizabethan stockings could possibly provide would be against sunburn. That argument falls flat, because they cover that part of the leg which cultivates the best hirsute shading, and if knees and forearms can become acclimated to the sun, so can calves and shins.

Another aggravating aspect of long socks is the propensity for one member of the pair to return from the laundry three inches shorter than its mate. Most women have abandoned seams in the interests of

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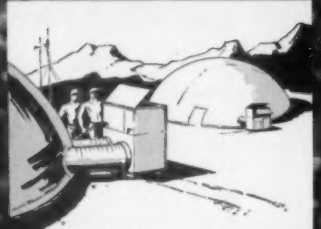

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convenience and appearance, but we still strive for symmetry by attempting to vary the thickness of top folds.

Perhaps the most annoying objection to abbreviated uniforms are the regulations that prescribe their wear. Although abbreviateds are considered completely appropriate as duty attire, some of our senior officers impose and enforce restrictions on off-post wear. Consequently, if you live off the reservation you must either carry a spare set of clothing or encounter problems on homeward errands.

What's wrong with public appearances in abbreviated uniforms before the class A curfew rings—at least in neighborhoods where Bermuda shorts are worn and where varied specimens of spindled, bowed, knobbed, or gnarled limbs are not likely to provoke excessive civilian mirth?

I say bundle up all long socks and ship them off to Britain from whence they came. Hang the garters around that sartorial sanctimony which places unreasonable limitations on daytime wear of abbreviated uniforms.

GAP IN COMMAND. *The staff committee is plugging the hole between the colonel and his company commanders and at the same time effectively muting the company commanders' opinions*

CAPT. TREVOR W. SWETT, JR.

I am surprised that lately the command structure of the infantry battle group has not been the subject of more comment in the military press. In my opinion, the current structure has generated serious and far-reaching difficulties which must be ironed out in short order if the infantry is to remain dominant on the battlefield.

The most obvious deficiency in the battle group lies in the commander-to-commander relationship. Historically, one of the strengths of the U. S. Army has been the sinewy firmness and dependability of its chain of command. Invariably, the genuinely successful senior commander has inspired an atmosphere of confidence, respect and trust in his handling of immediate subordinate commanders. I submit, however, that in today's battle group such an environment is very difficult, if not impossible, to attain.

It seems to me that the battle group stands a good chance of being commanded by committee. Although I can imagine the crimson flush rising above the collars of battle group commanders who read this, I urge them to bear a while and attempt to follow me from the point of view of the captain or first lieutenant company commander.

From the infantry division's TOE, we know that the battle group has seven companies: a headquarters company, a combat support company, and five rifle companies, each commanded by a captain. Very often, of course, a first lieutenant commands a company, and I have even heard of a second lieutenant or two inheriting this job upon occasion.

The TOE prescribes that a colonel command the battle group. With the number of infantry colonels today, and the paucity of battle group command slots, no doubt 99 per cent of our battle groups will always be commanded by colonels. Obviously, then, the connecting links in the battle group's chain of command are far apart considering experience, length of service, age and rank. This in itself is distance which the battle group commander can hurdle in a practical sense only through superb leadership and a dynamic personality. I have enough faith in our Army to know that in general this type of leadership is at the top of the battle group. Assuming for the sake of discussion that it *is* present in a hypothetical battle group, you ask why I charge that command by committee is a real threat.

The battle group commander is assisted by two lieutenant colonels (deputy commander and executive officer), and four principal staff officers (S1, S2, S3, S4) who are majors. There being a large number of infantry lieutenant colonels, chances are high that one of these will be filling each of the assistants' slots. You can say the same for the majors' positions, although it is not unlikely that a senior captain or two will be on a battle group's staff.

Seven field officers, then, from colonel to major, control the captain or first lieutenant company commander. The committee system develops simply by virtue of the prescribed duties of this version of "the sizable seven." The majors are busy recommending to the Old Man, through one or both of the lieutenant colonels, how to run the battle group. Frequently the colonel's decision will reflect his staff's thinking, which is usually as it should be. But how much of this will reflect the *company commander's* point of view?

Formerly this point of view could be forcefully (and sometimes picturesquely) expressed when the company commander went to iron out problems with the battalion staff, most of whom often were junior to him. The battalion commander in turn would joust with officers on the regimental staff, all of whom were junior to him. This system had a built-in safety valve, since the views of the subordinate commander could always be forcefully expressed at the next higher headquarters. Often this safety valve prevented presentation of a unanimous committee solution in the staff's recommendations to the colonel. With seven seniors constantly supervising the company commander, the safety valve no longer exists.

Small-unit commanders often sense that higher staffs fail to appreciate all their command troubles. How long will the forceful company commander last when, prone to express this concern in realistic terms, he must habitually argue with seniors? Human nature being what it is, the majors on the battle group's staff may get more than a little fed up with this drill, and

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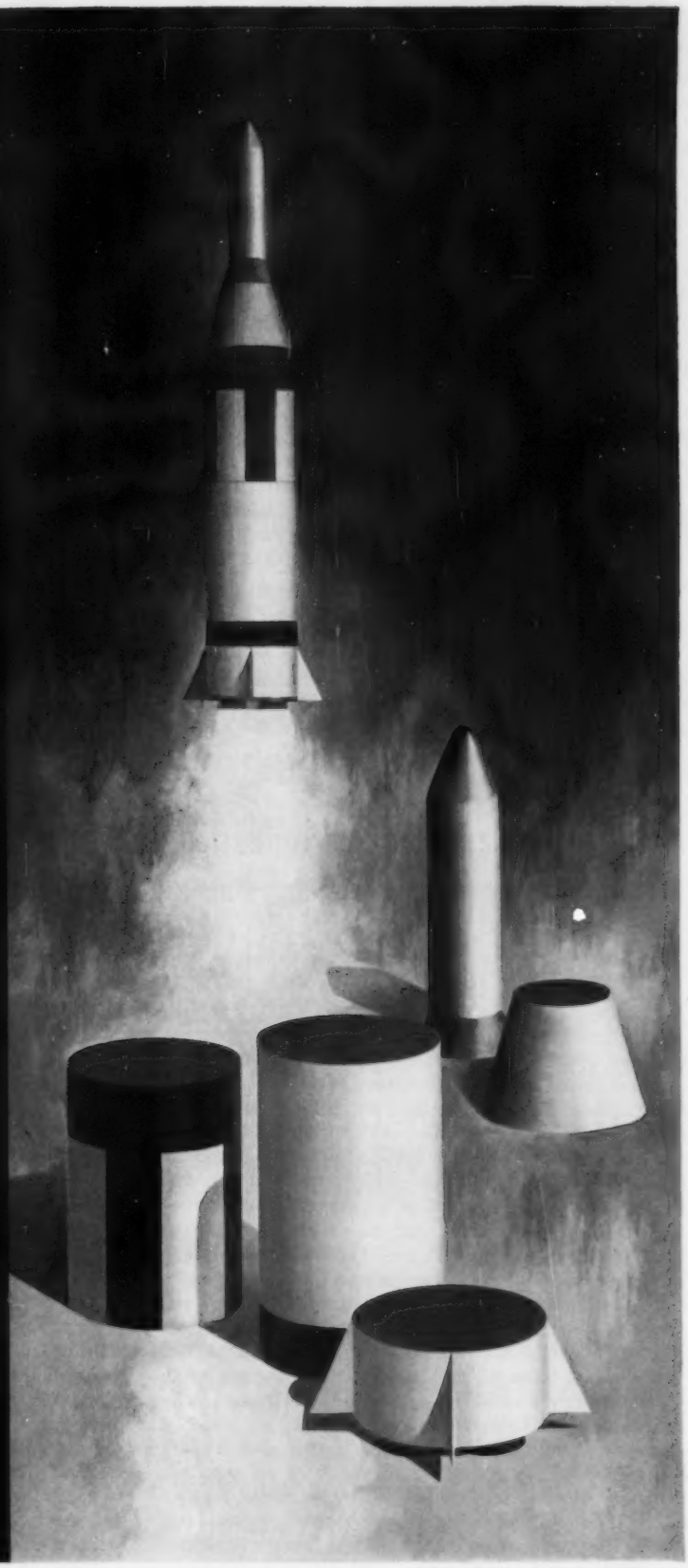


their annoyance will doubtless be reflected in their discussions with the colonel. Even if the colonel is sharp enough to recognize this possibility, it means that the company commander's life is less likely to be as happy as it used to be under the old system. Never have so few and so junior been supervised by so many so senior!

Now look at the problem from another direction. How long will it take today's captain company commander to become tomorrow's colonel battle group commander? Under current conditions, a captain can expect to remain in that grade from five to nine years. Assuming promotions open up somewhat within five years (by which time many World War II officers will have retired), I imagine today's captain can expect to be a major for six to nine years, and a lieutenant colonel for seven to 12. In other words, given an uninterrupted period of peace, it will probably take today's captain a minimum of 13 years to become a colonel even if he gets promoted today. Since there are currently no command positions in the infantry for him to fill in the interim, he just might lose his command touch while awaiting his next green-tab assignment!

Perhaps you argue that so long as we are not involved in a war, this command structure is not unacceptably harmful; and that if we get into a war, attrition will solve the problem. I think not.

In recent wars, attrition has created on the battlefield the laboratory in which subordinate combat leaders have gained the practical know-how for becoming more senior battle commanders. In World War II and Korea, solid battalion commanders often wound up as fine regimental commanders, even higher. In World War III or the next limited war, how long will it take for subordinate leaders to develop into battle group commanders? The mere fact that the transition would require three promotions makes this development awkward, to say the least.

When the current battle group structure was initiated, a few critics anticipated the problems I have discussed, and proffered the solution of promoting the company commander to major. This would certainly solve these problems, but in so doing, would generate others. For instance, the type of leadership needed within the company is characterized by enthusiasm, verve, nerve and initiative, and is more likely to exist without the presence of the mature field-grade approach. Besides, if an eager young officer must wait until he is a major before getting his teeth into real command responsibility, his ardor is likely to cool while his dissatisfaction grows.

I think a better solution is to bring back the battalion, commanded and staffed by the same grades as before, and to redesign the infantry division in the concept of the armored division's combat command. This would salvage the infantry's command structure, and would certainly provide as much (if not more) flexibility, firepower and maneuverability as we have now in the pentagonal division.

Whatever we do to improve the commander-to-commander relationship in the battle group, let's start *now*. Later may be too late.

ARE WE REALLY TRAINING NONCOMMISSIONED OFFICERS? *Under our current concept of conducting NCO academies, our needs are only partly being fulfilled*

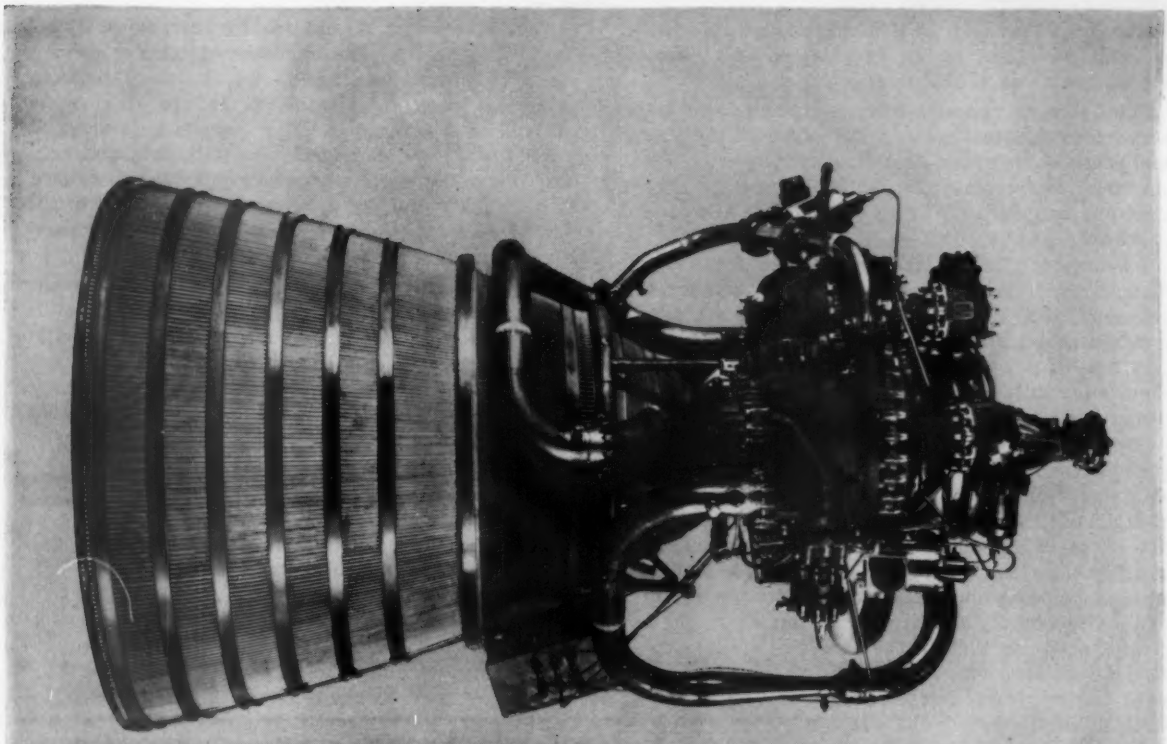
COL. LEONARD H. FULLER

It seems to me the commandant of every noncommissioned officers academy has written about or sounded off regarding how to run the perfect school. I am different in only one respect. Having been commandant of a noncommissoned officers academy, I think we need to consider their abolition. Before you label me a heretic, let me qualify that statement. Under our current concept of conducting noncommissioned officers academies, our needs are only partly being fulfilled. We should either consider their improvement or, as I said, discontinue these schools.

So that those who are short of time may know my proposal, I will state my suggestion first and develop it later. If you don't care to sit in on the discussion, you can say "Amen!" or "Hogwash!" after the next three sentences, and leave. I think that for noncommissioned officers our current, fast-moving, rapidly changing Army needs an academy of major proportions. The course should be for at least six months, centrally directed, and controlled by stringent regulations. It should teach all the basic aspects of command leadership, to include dedication, which we mistakenly assume are now being absorbed through time-in-grade and unit training.

I know that as a commander your first reaction will be: "Another empire builder!" or "I can't let my noncommissioned officers go for four weeks, let alone six months." But before you belabor me let us examine my proposition.

At one time, long ago and probably never again, a young soldier learned his trade by a long process of doing. Skill requirements were fewer, true, but the over-all caliber of soldier was not as high. Yet truly professional products resulted, because during those years the soldier was taught by unit noncommissioned officers with from 12 to 25 years of experience. His instruction included not only the technical skills required for proper performance of duty. The soldier got a well-rounded education in leadership and esprit from this noncommissioned officer hard core. This instruction was so good that not only were young soldiers properly indoctrinated, but many a young officer learned his basic leadership from these experienced noncommissioned officers. Today we desperately need this same type of hard core. However, having for 15 years seen something like 300 noncommissioned officers



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go through an academy, and having utilized these same or similar soldiers during various command assignments, I say this hard core does not exist.

True, today's noncommissioned officers have a far better formal education, and the caliber of the young soldier is the finest our Army has ever known—a real challenge to the leadership skill of the corps. What then has happened? Why do we have this admitted problem?

I believe the answer can be found in three areas. First, a requirement throughout the Army for greater and more highly developed technical skills; secondly, rapid turnover, and consequently more rapid promotion; finally, primarily as a result of the other two, a shortage in units of seasoned trainers in the leadership role.

Everyone knows that our skill requirements have increased and that we have been highly successful in obtaining technical training, to meet these requirements in our many fine schools. But this training takes time from drill, housekeeping, disciplinary training, and the many small jobs that go to season noncommissioned officers and make them dedicated in their role as leaders. Promotion was accelerated at the beginning of World War II, the average time for senior noncommissioned officers to attain their grade being eight to nine years, as compared with an average of 12 to 15 shortly before the war.

Even though there are more skills to master, less time is available for training, and as a result of attrition today's instructor has less and less experience. The corps as a whole grows weaker as trainers in leadership and the product they train become increasingly inferior in service dedication and management of men. Although many fine soldiers have experience, dedication and knowledge, there are not enough of this type to perpetuate these qualities in the corps (through the medium of unit training) without a long time lag, even, as many suggest, "if we could just have more time to do our own training."

Assuming that what we have just said is true, though I am sure many points can be argued, what corrective action can we take that will be long range in scope but immediate in results? The obvious answer: more leadership training for noncommissioned officers and potential noncommissioned officers. This was the answer in 1957 when the current regulation was written.

The establishment of standard training methods and a selected program of instruction was good. The use of many local academies to quickly reach the greatest number of people seemed sound and has, I am sure, accomplished much in the way of training. The indoctrination program directed towards commanders to interest them in the need for this training was excellent in conception, and was a much needed adjunct for any such an undertaking. Why then have we not achieved greater success in correcting our basic difficulty during the past three years?

First, a course of four to six weeks is too short and is not broad enough to make a lasting impression on the student. Secondly, commanders do not in all instances sell the program because of shortage of personnel, need for key men in their units, and loopholes in regulations that do not require attendance by all concerned. Lastly, noncommissioned officers do not yearn to attend because of the disparity between gains and losses for attendance. Failure of a course can and most often does bring reduction. It is much more difficult for older men to master a short, condensed course than a long, repetitious one. No reward such as promotion or a better assignment is forthcoming or even promised. Therefore senior noncommissioned officers must be forced to attend.

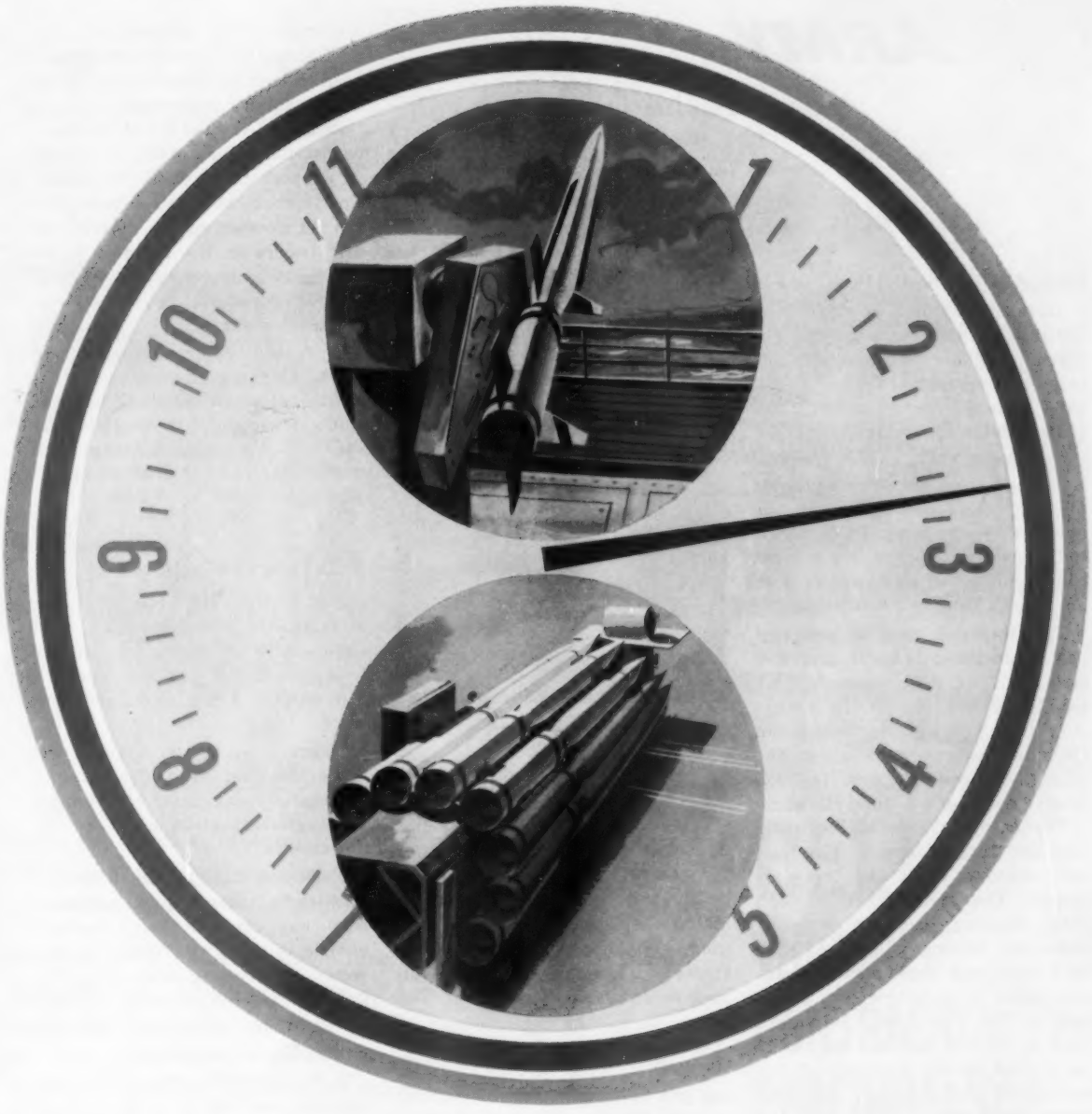
Thus we are failing to reach the all-important trainer portion of the current corps. So the academies continue to run fine schools but fight for students and faculty members with commanders who have other immediate and pressing missions. The over-all noncommissioned officer situation gets little better, and that very slowly.

What can we do? We can stop fighting the problem and return to unit training of noncommissioned officers with more time allotted for the purpose to battery and company commanders. (Don't ask *me* where this time would come from.) Another big disadvantage of this approach is a shortage of qualified trainers. We can continue our program and can eventually achieve a measure of success through much effort on the part of all commanders and academy personnel in following the spirit as well as the letter of the current regulation. We can change our program, yet retain all its good features: standard courses, indoctrination of commanders, and excellent instruction. However, some corrections need to be added.

The course should run at least six months (possibly a year). There should be one or two schools, but with much larger enrollments, where students would attend between assignments on a PCS basis. The faculty should assist graduates through advice, and potential students through correspondence courses. Both of these services should include the latest thinking and be geared to the needs of the corps. There should be opportunity for attendance early in the noncommissioned officer's service to guide him in his unit assignment, and late in his career to guide him in higher assignments. Each course should include subjects such as military history, combat development, psychology, mathematics, English, and service indoctrination; these in addition to school-of-the-soldier subjects and practical problems of small-unit leaders.

The regulation controlling the school would make it mandatory for a noncommissioned officer to graduate before being promoted beyond certain grades, or before assignments to high units. Automatic promotion to the next grade should be authorized for all honor and distinguished graduates of either school. The addition of these provisions would tend to overcome the undesirable trends in the current program.

If selections for attendance were made from both the top and bottom of the noncommissioned officer structure and gradual compression toward the center effected, we would soon permeate the thinking and actions of the entire corps. This may lead to an empire, but if we are to have a knowledgeable, dedicated noncommissioned officer corps, it seems the only way to attain such a high goal.



FROM REST TO READY....**LESS THAN A MINUTE**

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ARMY irons in the fire

New AT Grenade

Development of a powerful new antitank grenade, to team with the 90mm recoilless rifle and give the infantryman unprecedented protection against enemy armor, has been announced by the Army.

Called the XM72 rocket grenade, it is fired from its own disposable packing container and can be handled by one man. In fact, the individual soldier can carry a sheaf of four somewhat as an archer does his arrows.

The warhead uses a powerful new Ordnance-developed explosive called OCTOL (25 per cent TNT and 75 per cent cyclotetra methylene tetra nitramine), which an Ordnance officer said gives the 66mm warhead at least the explosive power of a 105mm HE shell.

The carrying case is 25 inches long and three inches in diameter, and weighs four and one-half pounds. The grenade can be fired from standing, kneeling or prone positions. Aiming is accomplished by a rear peep sight and a graduated sight (a sample shown newsmen at the Pentagon was graduated up to 300 meters) imprinted on a clear plastic rectangle at the mouth of the launcher. An Ordnance spokesman said that the weapon "has a kick about like a carbine."

The XM72 can be equally effective against concrete bunkers, earth-filled log emplacements and sandbag fortifications, the Army said.

A solid-fuel motor furnishes propulsion and burns out before the rocket leaves the tube. In flight, magnesium fins spring into place for stabilization.

Size, weight and simplicity of operation make the new grenade readily adaptable to mass production. The Hesse-Eastern Division, Flightex Fabrics, Inc. of Everett, Mass., is prime contractor.

One-Man Tank-Killer

Hydrofoil Demonstrated

A 23-foot, gas turbine propelled hydrofoil vessel being developed for the Office of Naval Research by Dynamic Developments, Inc., an affiliate of Grumman Aircraft Engineering Corporation, was demonstrated at the Third Annual Symposium on Hydrodynamics at The Hague.

The experimental craft, called the XCH-6, is one of the two existing gas turbine powered hydrofoil vessels and the only turbine powered vessel fitted with supercavitating foils. It has been designed to achieve a guaranteed speed of 70 mph and will be the fastest hydrofoil in existence. Still under development, the boat has already achieved speeds of 50 mph.

The XCH-6 has been built primarily to demonstrate the validity of supercavitation principles. Other hydrofoils have reached speeds of 50 mph but at the expense of great amounts of power to overcome the problem of cavitation.

(Cavitation occurs when vehicles move through the water at increasingly higher speeds. When a condition of cavitation exists, the water about the surfaces of a hydrofoil becomes steam or vapor—even though the temperature of the water remains unchanged. A vapor "cavity" is formed which causes a reduction in the ability of the foil to support the vessel. The condition is such that it presents a barrier to greater speeds. Cavitation also occurs in the attempt to increase the revolutions of conventional propellers, preventing an increase in thrust.)

A former Navy research project by Dynamic Developments, the XCH-4, attained speeds of 90 mph. Not a new concept, hydrofoils date back to Alexander Graham Bell whose earliest hydrofoil vessel achieved a speed of 70 mph.

M60 Tank Production

The first of 720 production line M60 tanks to be built at the Chrysler-operated Detroit tank plant are now coming off the line under a $60 million Army Ordnance contract.

Delivery of the first tank was made late last year after it had successfully completed the Army's thorough inspection and test requirements.

Each new tank, which incorporates more technological advances than any other military tracked vehicle in the Free World, is subjected to grueling tests over the Detroit Arsenal Proving Ground before final acceptance by the Army. The tests include:

A 60 per cent upward slope for climbing and brake tests.

A 36 per cent sideward slope to tets fuel distribution.

An undulating steel-constructed road strip to test the vehicle's suspension system.

A four-foot-deep water fording pit to assure that the engine and crew compartments are leak-proof.

The M60, the Army's "main battle tank," includes many thoroughly tested features never before incorporated into tank design and production.

Wide use of aluminum components, including fuel tanks, fenders, platform floor, road wheel discs, and track support roller discs, have

In the evaluation of helicopter development and production capability, contract performance is just as important as flight performance . . and Bell helicopter leads in both!

Bell has proved its leadership in turbine-powered flight performance with seven world records set by Army's HU-1 Iroquois. Bell has also proved its leadership in contract performance by delivering every Iroquois *on, or ahead of, schedule!* And, Bell has maintained this contract performance record from contract go-ahead on the HU-1 prototype, the XH-40, which beat development schedules by months!

Bell's capability of delivering this dual record-breaking performance is possible because only Bell is staffed with a turbine experienced team at every engineering, manufacturing, and management level . . and, because its physical plant is the world's first manufacturing facility built specifically for, and used exclusively in, the production of helicopters.

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been adopted in the tank for the first time. This enables heavier armor to be used in the more vulnerable areas, reduces by several tons the vehicle's overall combat weight, and greatly increases mobility.

The diesel-powered vehicle, with its rapid-firing high-velocity 105mm gun, is said to have the firepower of a heavy tank.

Display System

An automated, rapid full-color display system for military applications is under development by a team of technicians from three companies. The system will use advanced symbol generation and film handling techniques of Ramo-Wooldridge, opics developed by Colorvision, Inc., to convert black and white images to color, and plastic film produced by Kalvar Corp., to provide an integrated, rapid full-color system. The display system will be capable of producing and projecting updated information and background materials for use in a variety of military command and control situations, such as analyzing information on deployment of enemy troops and location of enemy targets. In seconds, desired information can be projected onto screens up to 10 feet square, and the system can be tied to a wide variety of data processing and computer systems.

New Line of 'Dozers

After a five-year absence from the heavy equipment field, R. G. LeTourneau, Inc., of Longview, Texas, has come up with a line of giant tractors and bulldozers powered entirely with electricity.

Power is derived from diesel generators which deliver electricity to the wheels—thus enabling each wheel to exert the exact amount of power needed for a job.

According to the manufacturer, these new machines combine in one unit the prime advantage of crawler tractors—massive power at low speed—with rubber-tired tractors' advantage of speed and mobility.

While auto makers are turning to smaller cars, construction equipment manufacturers have been going the other way—increasing size, capacity and horsepower with every new model. The "smallest" tractor of the new LeTourneau line is a three-wheeled bulldozer—but each of these wheels is more than six feet high and is built around a motor and gear reduction capable of imparting over 100 horsepower. The largest, on the other hand, weighs 73 tons and has an 840-horsepower generating plant to feed its four electric wheels.

hot sparks

Major General August Schomburg, the Army's missile chief, has announced that a program is under way to develop a "hybrid" missile which will combine the best features of both liquid and solid propellants so as to achieve better range, weight and mobility.

Work is going forward on the Army's Hawk SSM with Raytheon receiving a $2.4 million letter contract for developing and testing the system.

In the field of surveillance drones the Army terminated a contract with Republic Aviation for the SD-4 Drone and gave Fairchild Engine and Airplane Corp., an additional $1.9 million on an existing contract for the AN/USD-5 Drone Surveillance System. Termination of the SD-4 was the result of re-evaluation of increasing costs of the system and the desirability of applying the related funds to other projects.

The Sperry Utah Engineering Laboratory has been awarded a contract for the first operational Sergeant surface-to-surface missiles and ground equipment. Previous Sergeants have been produced for R&D purposes. The contract was for $16,855,000.

Why not use a "flat" car? World's largest tires are being "shoehorned" into boxcars with oversize doors at Goodyear in Akron for shipment to Fort Eustis, Va. The tires, nearly ten feet in diameter and especially designed for snow-covered terrain, were enroute to Alaska for use in the Army's "Exercise Willow Freeze" this month.

Moon Trip Schedule

You could almost, but not quite, make it to the moon on a three-day pass according to the time schedule set up by Dr. Roy G. Brereton of Aerojet General's Advanced Research Division.

Dr. Brereton has figured it out to 3 days 12 hours 20 minutes for the three-leg trip he proposes instead of the one big leap Jules Verne envisioned in the last century.

The Doctor suggests that a rocket-powered shuttle ship would first take the space traveler to a station in orbit around the earth. From there he'd take an ion-powered spaceship to another station orbiting the moon and then board a rugged, rocket-powered landing craft to the moon's surface. Dr. Brereton points out that all three of the vehicles would be re-usable—not lost in space as rocket stages would be under the one-leap idea.

ARMY books

STRATEGY IS NATIONAL

DEFENSE: POLICY AND STRATEGY. Air Vice Marshal E. J. Kingston-McCloughry. Frederick A. Praeger, Inc. 272 Pages; Index; $6.00.

Reviewed by

COL. WILLIAM R. KINTNER, who is Deputy Director of the Foreign Policy Research Institute.

This is a well-written, down-to-earth appraisal of Great Britain's defense policies within the context of the Western alliance. The Air Marshal recognizes that today military forces comprise only a part of the total array of power which dictates a nation's strategy. His book is characterized by breadth of vision, tolerance of viewpoint, and an awareness of the full spectrum of conflict for which military power is essential. It is noteworthy for its absence of parochialism, and for its understanding of the roles of the various armed services.

The author recognizes that the armed forces of the Western alliance must realize that the ability to deal effectively with the Cold War now has become one of the most important aspects of strategy. Throughout he expresses the conviction that the Anglo-American alliance must form the base of any successful Free World strategy.

In view of the author's concern with the Cold War, his realization of the invariable disadvantage a non-aggressor faces in dealing with a revolutionary power is worth keeping in mind. He also accepts that today a prime feature of conflict is the struggle of ideologies.

The evolutionary character of strategy, he points out, is currently undergoing a dynamic transformation, shaped on the one hand by ideological forces reminiscent of the Crusades, and on the other by the great destructiveness implicit in nuclear weapons. Thus, since the object of military forces is to deter war, if possible, the struggle will be waged largely along the political front. This makes it more and more imperative that strategy and its political direction be interwoven into the whole at the highest possible level—that military and political leaders formulate strategy together. The Air Marshal makes the plea, so often heard about the Pentagon, for greater political direction in the employment of armed forces either in local wars or in a possible total war, since political expediency militates against any sound military strategy.

Regarding the actual strategies being pursued by the Western powers, the author asserts that, in many instances, Western strategy has been dictated by fiscal restraints which inevitably "give our opponents scope and opportunity to use diplomacy and to create situations to the Allies' disadvantage." While confirming that weapons development and technology are the most important single factors affecting war and its conduct, the Air Marshal does emphasize sufficiently the dynamic technology of weapons development. His belief that the threat of mutual annihilation has given a sense of apparent stability to the strategic and political world picture may be too optimistic. He criticizes the doctrine of massive retaliation because it was all too inclusive and takes almost no account of the spectrum between "a brush fire" and a total nuclear offensive. He sees the absolute imperative of Allied cooperation, going so far as to state that a national strategy "may not even begin to be considered before the establishment of a sound Allied strategy is agreed upon." This statement should be writ large in every capital of the Western alliance, for there is no single Allied power that does not violate it. Likewise he puts his finger on some of the current difficulties confronting NATO, particularly as to whether any Soviet act of aggression in Europe should lead to the automatic triggering of nuclear retaliation against the Soviet Union.

In view of our recurring interest in Defense Department organization, the Air Marshal's objective treatment of these problems deserves special emphasis. It is difficult now to draw a clear-cut line of responsibility at the national level between political and military authorities. He highlights the problem of allocating the scientific and technological industrial resources of any country among competing civil military elements. He is also aware of the traditional factors which obviate a more orderly organizational solution, stating flatly that "If the United Kingdom were today a recently created state, organizing her fighting forces, it is inconceivable that they would be separated into three services." In treating this issue, he makes some very cogent assertions: military operations today are joint; they should be directed by the Ministry of Defense rather than by separate service ministries (the Ministry of Defense will, of necessity, control operations in wartime, so organizational arrangements should permit such control now), for there will be no time to readjust on the day war begins. He states that "the central organization for defense should be resolved as quick as possible, so that in both peace (Cold War) or war, the whole machine will work efficiently and swiftly."

Wearing his Allied hat, the Air Marshal comments on the fact that the most disturbing factor in the total security of the West is the fierce interservice rivalry in Washington over the issues of direction of military forces and allocation of resources. He draws interesting parallels from Great Britain's military history (inferentially important to the United States), particularly the development of an independent air force in both countries. Although he argues for greatly improved readiness in defense organization in Britain, the Air Marshal seems to take the evolutionary line in stating that "It will probably be more advantageous to increase the scope and power of the Ministry of Defense little by little, feeling the power and stress gradually at each move." Then he adds that "such a

process makes it all the more imperative that the services should know where they are going; there should be a long-term outline plan for further coordination of effort."

The consideration of the contribution which land, sea, and air forces can bring to over-all Western strategy is sound. The author is aware of the serious issue presented by Western reduction of NATO land forces largely in consequence of domestic political, rather than overriding national and Allied considerations. He wisely points out that the Western nations tend to shape their military strength on weapons, and "that they are reluctant to accept the sacrifice necessary to provide manpower even on a relatively small scale." This places the Western powers at a disadvantage, particularly since Communist powers arrange things differently. He suggests that one way out of this dilemma would be to adopt some sort of citizen-army concept.

With regard to naval and air forces, the Air Marshal seems to believe that some greater integration of the two is essential, particularly since the air component has become the primary feature of maritime power. He states that there could possibly be far-reaching advantage in amalgamating the sea and air forces, but that this would require most careful evaluation before it could take place. Again he returns to fundamentals: the national strategy must be the master, maritime and air strategy (and, implicitly, also army strategy) its servants.

Noteworthy, too, is the importance he attaches to home or civil defense. The Western powers, including the U.S. and the United Kingdom, are not giving this matter adequate attention. Home-defense preparations are required on a realistic scale, both to maintain the will of the people to fight, and the ability to continue hostilities.

On almost every subject examined, this book reflects solid understanding of the real issues. It ends on the same high note with which it begins. Unity at the political level is required if the Western alliance is to survive; the Cold War basically is important, since its consequences will have a most profound effect on the military position. The primary message is that strategy is a national affair, and that all elements of the nation must play their part in insuring national survival and safeguarding the civilization we cherish.

RECOVERING THE INITIATIVE

THE EDGE OF WAR. James D. Atkinson. Henry Regnery Company. 318 Pages; Index; $6.00.

Reviewed by

BRIG. GEN. DONALD ARMSTRONG, who in 1959 was Commandant and in 1960 Director of the Defense Strategy Seminar at the National War College.

Cuba in Communist hands comes close to being another Pearl Harbor, but in 1941 the American people understood Pearl Harbor. Today the enormity of the disaster in Cuba is lost on most Americans. The gradual erosion of the Free World by the indirect approach of Communism nibbles away our strength by little pieces. Unless we heed the voices of the prophets and understand the subtle and insidious progress of the Communist front, the Cold War will be lost, and sooner than we think possible. And therefore, in the hope that it will add more recruits to join the fighting front against further Communist aggression, another thoughtful and competent study of the unconventional war is decidedly welcome.

Such a book is Dr. Atkinson's analysis of why we and the Communists behave as we and they do in the struggle for the future. It examines all the Cold War weapons in the Communist arsenals, and formidable they are. It is a thorough and a convincing book. It adds important new material for a better estimate of the situation. Together with his valuable review of the handicaps of our heritage in meeting the enemy on this new kind of battlefield, his book points the way to recovering the initiative in the protracted conflict.

Now the components of Communist tactics in the Cold War are not new. What is new is the pattern of aggression with these tools and their employment in time of "peace" to win a war without firing a shot or launching a nuclear missile. Blackmail with these latest weapons is proving terribly effective and our need to counteract it with a sure deterrent is of paramount importance.

We have been hampered by our belief that war is war, and peace is peace, and never the twain shall meet. That is not the Communist belief, however, and a balance sheet of their victories and our defeats during the past decades is proof of the need for vigorous changes in our theory. Here again we are at a disadvantage; for until recently theorists on warfare have been practically non-existent in the United States. Dr. Atkinson has added additional convincing evidence to the clarion calls for decisive and swift action by a united people if we hope to avoid the outcome the Communist world is preparing for us.

BEST ON SEA LION

HITLER CONFRONTS ENGLAND. Rear Adm. Walter Ansel. Duke University Press. 348 Pages; Illustrated; Maps; Index; $7.50.

Reviewed by

LT. COL. H. A. DEWEERD, author of articles and books on leaders of both World Wars.

Admiral Ansel knows a great deal about planning and executing landing operations. He helped write a Navy manual on the subject prior to World War II and was operations officer during the invasions of Northwest Africa and Sicily. As commander of the cruiser *Philadelphia*, he took part in landings in Italy and southern France. He spent 1952 and 1953 as a Forrestal Fellow of the U.S. Naval Academy in research on and in interviewing German leaders about their abortive plan (Operation Sea Lion) for invading England in 1940. With his impressive research, his wide experience, and sailor's insight, he has produced the best story in existence of the background, planning, and preparations for Sea Lion. Had he avoided eccentric language and spurned temptations to indulge in quarterdeck efforts at the philosophy of history, he might have produced a real classic.

Ansel's main achievement is to portray the development of Sea Lion against the background of Hitler's agonizing reappraisal of the proper course for Germany after Churchill ignored his peace

overtures. He describes the tri-service politics of pre-invasion preparations and assesses the capabilities of the German invasion force to make good an assault on England, had Hitler given the command. But Hitler, a landsman, never really had his heart in the business. He was much more at home dreaming of an expanded *Germania* to be carved out of eastern Europe and the Soviet Union. Thus Der Führer's real intentions after July 1940 were to invade Russia, not England; and with typical skill and evil results he used Sea Lion to play off navy and army commanders against one another.

While Goering was trying to knock out England with the Luftwaffe, and while Hitler was brooding at Obersalzberg, army and navy leaders along the invasion front began to prepare for X-day. They, at least, meant business, and the extent of their preparations will come as a surprise to most Americans. Full of zeal and ingenuity, they improvised landing barges, built Siebel ferries, modified Rhine steamers, organized landing waves, practiced "storm boat" operations, carried out maneuvers and waited impatiently for their leader to make up his mind. Interviewed by Ansel after the war, some expressed nostalgic curiosity about how the invasion attempt might have worked out.

Ansel estimates that had Sea Lion been mounted on the morning of 26 September 1940, the poorly constituted invasion fleet would have been picked up by British reconnaissance. The hundreds of slow, converted *prahms* (Rhine steamers) carrying the bulk of the initial landing wave would have been cut to pieces by resolute destroyer attacks after dark. By the time British heavy ships appeared on the morning of the 27th "Sea Lion would have been gutted." In Ansel's view, an attempt to execute Sea Lion as it was set up in 1940 "held the prospect of major German disaster."

Admiral Ansel apparently felt compelled to add a final "Assessment" to his book. In it he employs some very strange language. What the author apparently wanted to say in this unfortunate section of an otherwise splendid book, was that we should study enemy leaders; that landing operations are important; and that nuclear weapons are no substitutes for policy and strategy.

FOR SERVICE ENTHUSIASTS

THE ARMY BLUE BOOK; THE NAVY BLUE BOOK; THE AIR FORCE BLUE BOOK. Military Publishing Institute. $1.50 each.

Reviewed by

COL. S. LEGREE.

Basically, these three volumes follow the same pattern. A review of the Army volume for the ARMY audience should give partisans of the other services, or those who desire a complete set, sufficient information concerning all.

There is much material here for the price: 33 chapters, covering 195 pages of small print. Each chapter deals with a different subject; most are by-lined. S. L. A. Marshall discusses Korea ten years after. General Lemnitzer's article is condensed from one in *Army Information Digest*. General Taylor's is from an article in *Look*, which in turn was adapted from his book, *The Uncertain Trumpet*. A piece by Elvis Presley, "as told to George Riemer," is from *This Week* Magazine. General Trudeau's is abridged from one in AID for May 1960.

The articles, or chapters, discuss such widely varied subjects as the ROTC, the women's services, the civilian components, infantry, armor (but not artillery), American soldiers overseas, and so on.

The section "Army Facts," 120 pages, devotes four lines to the revolver, caliber .38, two-inch barrel, M13; five to the Pershing missile. It brings in the recent survey on best-liked and least-liked foods, listing the ten at each end; it gives the strength of the Army for each year since 1925, compares certain U. S. and Soviet weapons, and lists Medal of Honor winners from World War I to the present. The sections on major units are, in many cases, doomed to partial obsolescence between compilation and publication, but in general these include facts that are useful to anyone working in or for the Army.

This is, in short, a creditable first effort which offers much of interest to those interested in the Army. The facts section is no substitute for *The Army Almanac;* portions of the text are somewhat dated by the time of publication. However, the book includes much timeless, informative and useful reference material. It is well worth the modest price. Speechmakers, particularly, will find it useful.

THE UNKNOWN CIVIL WAR

THE CIVIL WAR IN THE WESTERN TERRITORIES. Ray Charles Colton. University of Oklahoma Press. 230 Pages; Maps; Index; $5.00.

SIBLEY'S NEW MEXICO CAMPAIGN. Martin Hardwick Hall. University of Texas Press. 366 Pages; Illustrated; Maps; Index; $6.00.

THE WAR IN THE FAR WEST: 1861-1865. Oscar Lewis. Doubleday & Company. 263 Pages; $3.95.

THE CIVIL WAR IN THE NORTHWEST. Robert Huhn Jones. University of Oklahoma Press. 216 Pages; Illustrated; Maps; Index; $4.00.

Reviewed by

N. J. ANTHONY, an Associate Editor of *Army*, who has done considerable research on the Civil War.

Most Civil War histories shrug off the fighting in the Southwest and Northwest as unimportant, overlooking the fact that control of these areas required thousands of Union troops.

Even before the cold war in the East got hot, Confederate officials cast an eye on New Mexico (including what is now Arizona), with its natural resources and Army posts stocked with supplies and equipment. Figuring that southern California was sympathetic, they planned to seize these areas and thus extend the Confederacy to the Pacific. Brig. Gen. Henry Hopkins Sibley was Confederate commander. He was opposed by Col. Edward R. S. Canby.

The jockeying for control culminated in the Confederate victory at Valverde, 21 February 1862, a bloody affair. High tide for the Confederates came with their defeat on 26 and 28 March 1862 at Apache Canyon (or Glorieta Pass), "the Gettysburg of the West," 20 miles southeast of Santa Fe. With it the Union abandoned plans to invade Texas. Thereafter the Confederates were contained, and U.S. forces under Brig. Gen. James H. Carleton controlled the area except for sporadic Indian actions.

Carleton's classic march of his "California Column" to reinforce

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Canby, one of the most arduous in history, is overlooked by historians. Starting from southern California on 13 April 1862, it reached Santa Fe on 20 September. Carleton marched his men in serials, so that one group would drain a well and the next arrive when it had refilled. And this across country you'd be foolish to drive over without extra gas and water and a spare fan belt.

The first two books, both fine studies, complement each other rather than compete. Colton's ably treats all operations, including those against Indians, in Colorado, New Mexico and Utah during the whole war, as well as the political developments. Hall's discusses only Sibley's campaign of 1862, has better maps, and includes muster rolls of all units of his army. Both are well documented, and fill a void.

Rather than being a history of the war in the Far West, Mr. Lewis's book relates the part of its people in the East and locally. For the most part it deals with Copperhead activities and political affairs. The military operations concerned with the Confederate invasion and withdrawal are treated in the most general terms in 29 pages. The text is top-heavy with quotations, few of which are documented. There are no maps, no bibliography, no index.

Jones's book narrates the operations in the Department of the Northwest (Nebraska, the Dakotas, Minnesota, Wisconsin, and Iowa), under Maj. Gen. John Pope. Brig. Gen. Henry Hastings Sibley was field commander. Pope proved an able theater commander. Besides contending with Indian uprisings, he was troubled by the draft, Copperheads, civil affairs, and Indian administration.

All actions here were against Indians. The Sioux, who proved most formidable, were broken when Sibley stumbled upon them and routed them at Wood Lake in September 1862. Other large-scale operations were the Sirocco campaign of 1863 and the Dakota Badlands campaign of 1864.

While this is a fine factual account, with excellent maps, it is not the detailed military study we need. A reading leaves the impression that it was originally a doctoral dissertation.

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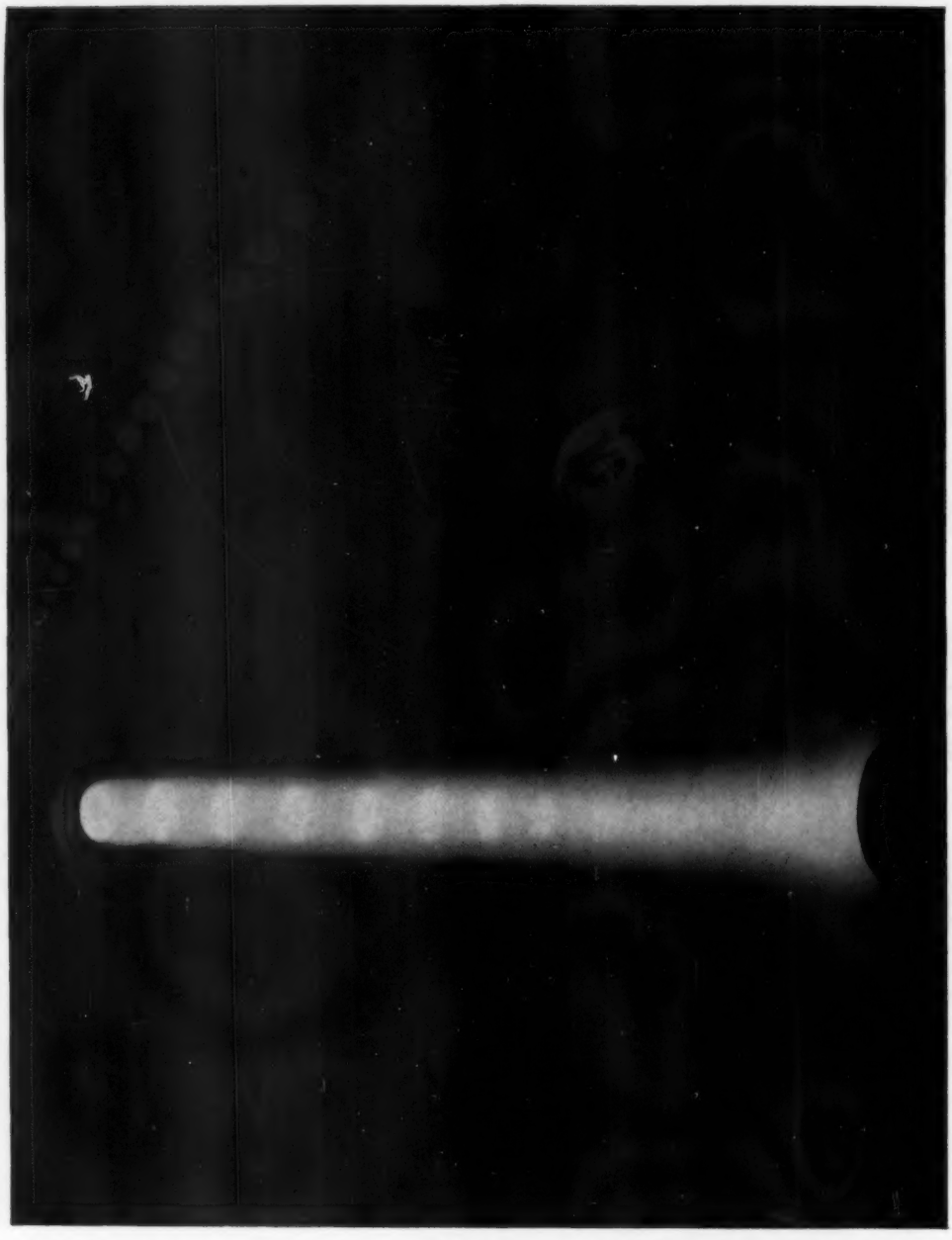

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